Designing New Contexts for Online Communities

Marco Adria

The Canadian political economist Harold Adams Innis has argued that there is a social, economic, and political price to be paid for the proportional weight given to the written word and the spoken word as a consequence of the emphasis that a society gives to a particular medium of communication. The approach of Innis is applied in this paper to the question of whether public space may be transformed for the purpose of enhancing dialogue and interaction for online communities. By attending to the physical and human geography of the context for online communities, it may be possible to achieve a kind of social balance or ecology. Such a balance would allow these communities to thrive as public sites for dialogue. The public library is used as a case study of a social space that has historically been devoted to instrumental action (information seeking or finding information) in transition to social space that could be characterized by discursive action (or dialogue and interaction). The transformation of the public library as a service environment of the alphabet and text to a dialogical environment of speech acts is considered.

'Virtual Supervisor':
Use of E-mail in Scholarly Communication for Support Graduate Research

Ahmed Taha

The impact of the e-mail on the scholarly communication is clearly demonstrated in the way that the scholars exchange scientific information among research communities to herald the phenomenon of *invisible colleges*, which emerged as a dominant paradigm for effective promotion of research communication. This paper reports the findings of a trial tutorial designed purposely to develop scholarly communication skills of MSc candidates at UAEU for using e-mail in correspondence with the virtual researchers involved in related research fields for the purpose of requesting reprints and research consultations while conducting their dissertation research. The outcomes are discussed within the realm of improving MSc research rigor.

Examination of Technologies for Student-Generated Work in a Peer-Led, Peer-Review Instructional Environment

Brian P. Coppola and Alan L. Kiste

There is a growing literature demonstrating the effectiveness of using computer environments to assist students' in visualizing science and mathematics concepts. However, with many of these computerized learning environments, students do not have the option of manipulating the environment. Instead, they are presented with pre-made visualizations. Enabling students to display their understanding through multiple representational forms is more interesting. In our peer-led, peer-review environment, students generate a complex, literaturebased, multimedia text on which their final examination is based. However, there are great time and personnel costs in this design. Collaborating with SRI Inc., we are addressing these demands via the ChemSense Knowledge Building Environment. This second-generation tool allows students to create texts, images and animations using one simple application. Peer-review is facilitated. We have begun to develop and modify methods of visual discourse analysis in order to examine the effectiveness of the ChemSense KBE in assisting students in their development of representational competence.

Patterned Review of Disease States and Organ Systems Interrelationships Improves Critical Thinking Scores on Pre-test for Nutrition Internship Program

Andrea Lasichak

The skills of understanding relationship of nutrients to disease state, implications in treatment and control of progression of disease are the most difficult concepts for interns to assimilate.
Individual classes present facts from many disciplines, with multiple choice tests for fact recognition. Interns are expert students and expect to continue to add facts to their collection. What interns need is thought patterning, rather than being an innate talent, interns need guidance in organizing their repertoire of facts into deductive thought patterns.
A guided systematic review via e-mail practicing critical thinking and application of knowledge prior to orientation improve these critical thinking skills throughout the internship.

Teaching & Learning in Real Time:
A case study in using ICT and Concepts from Business and Economics Literature to alter the Architecture of a Business Economics Course

Antonio Dottore

Drawing upon literature from Economics and Management, as well as business case studies, we design and implement a Knowledge Management System (KMS) in the third year subject Economics of Business and Business Strategy. *Formal* aspects of the KMS were implemented using the course website. A Knowledge Management Committee - lecturer and volunteer students - managed the process. It gathered and awarded prizes at the end of the semester. Participation in the KMS counted towards formal assessment under the heading "Contribution to Topic Success". The outcome was considered positive, as measured by: responses to open-ended questions in the Evaluation questionnaire; quantity and quality of interactions; end of semester dinner organised by students.

A Decision Support System for management of the distribution of regional activities

Ardeshir Anjomani

This paper deals with land use/environmental planning problems in a multi jurisdictional and multi regional setting. A Decision support system (DSS) and the related process, which utilizes Geographic Information System (GIS) and optimization models, are used for this type of analysis. The paper attempts to show how the process and the DSS can be used in real world situations to help in analysis and planning of distribution of activities at regional level where multiple jurisdictions and economic regions are involved. This would help decision makers in different market settings and jurisdictions to understand regional implications of their decisions and to facilitate in negotiations with other entities.

The Role of ICT in bridge building and social inclusion; the Dissolving Boundaries Programme in Ireland

Roger Austin

This paper will report on the work of a unique project which is using telecommunications to link teachers and pupils both across the political boundary between Northern Ireland and the Republic of Ireland and across the boundaries of 'mainstream' schooling and those children in 'special schools'.
This programme, funded by the Departments of Education in Belfast and Dublin, has a significance well beyond the island of Ireland both because of its scale and because of the emerging evidence about the impact of ICT on teachers and pupils in the 121 schools that are actively involved in the programme.

A Practical Business Course for Engineers and Computer Scientists

Bert Lundy

The author asserts that there is a critical "hole" in science and engineering education at most universities: little or no coursework is devoted to business and economics issues, especially at the graduate level. Thus many graduates leave the university with a high degree of technical knowledge, but little understanding of business realities. This ignorance can and often does lead to disappointing results in both the professional and personal arenas. A few selected situations are described which illustrate the need for a better business-economic background, and then a business class for engineers is described which the author has developed and taught over the past several years. Critical topics which should be covered are listed, justified and briefly described.

Economically Saving Venice from the Sea

Carl Johnson

The city of Venice, Italy has great historic importance as well as being a popular tourist destination because of its unique canals. For centuries, Venice and the region around it have been sinking and daily tides already cause great damage. As the sinking continues and global warming causes sea levels to rise, Venice may be completely destroyed in only 50 years if nothing is done to try to save it.
An incredibly expensive project is being pursued now that the leaders of Venice realize the urgency of their situation. An arrangement of movable dams, much like the movable gates of a ship canal, are proposed to be installed across the entrances of the lagoon. This first seems like an interesting idea, except for the tremendous cost! But the concept also has limitations and problems. Environmentalists are concerned that if the gates are closed too often, pollution may accumulate inside the lagoon. More importantly, if the rate of sinking of the city continues and if global warming continues to cause the sea level to rise, in only twenty or thirty years, the tides will be so high as to go over the top of those barriers and even the barrier islands themselves. So, at best, that approach seems like only a temporary solution. If it were not such a costly concept, it might be worth trying, but to only extend the existence of Venice by twenty years or so, it seems too expensive for a project that may not even work as intended.

On the nature of inter-firm co-operation and "clusters": a conceptual framework

Christos Pitelis

We critically assess extant theory of inter-firm co-operation (IFC) and "clusters". We claim that so far as the "nature" of inter-firm co-operation and clusters is concerned (i.e., why do they exist), the work is limited and fails adequately to explain these phenomena. This is despite a huge amount of literature and interest. We aim to address this gap by building on extant theory, notably transaction costs, and resource-based. We suggest that, in order to answer the question "why inter-firm co-operation and clusters?" – vis-à-vis integration by firms (hierarchy), markets, and alternative forms of IFC – one needs to explain their differential (dis)advantages vis-à-vis such alternative modes of the organisation of production. We employ dynamic transaction costs, resource-based and George Richardson's analysis to explain IFC. We then link this outcome to clusters and explain the latter in terms of factors that explain IFC, as well as agglomeration, external, and other locational economies.

Properties of Shift Register Sequences in Informatics

Qijian Hu and Chuan-Gan Hu

In this paper, we use firstly the method of complex and functional analysis in mathematics to obtain the vector-valued expression and some results of shift register sequences, and to establish the relations between a feedback sequence and a feedforward sequence of a shift register.

A New Security Technique for Mobile Commerce based on Watermarked Voice Cheques

Song Yuan, Dan Honciuc, and Sorin A. Huss

Many of the current mobile commerce applications and services suffer from several security leakage problems. A consequent exploitation of biometric identifiers (such as human voice) integrated into multimedia processing techniques may turn out to be a viable solution to these problems. In this paper we demonstrate how digital watermarking techniques and authentication protocols can efficiently be integrated into the infrastructure of the mobile commerce scenario. First, we point out some drawbacks of the present key-based smart cards access control mechanisms. Then, we suggest a novel approach, which is based on human speech as an access key. Further on, the concept of "Voice Cheque" is introduced as well as the technical details for its generation. In the last section of the paper we outline the derived secure transmission and authentication methods and we present the software simulation modules that have already been implemented and evaluated for m-commerce scenarios.

A Framework for Collaborative Decision-Making under Uncertainty On Multi-Agent Sytems

Daniel Ortiz

In multi-agent systems, joint goals are achieved collectively through collaboration. However, decisions affecting the team as a whole must take into account the viewpoint of all specialized agents. Moreover, decisions must be made with partial, contradictory or uncertain information. This paper presents a framework to guide and facilitate the decision-making process of multiple specialized agents working collaboratively to achieve common goals. Our proposed framework evaluates the risk of making decisions with partial and imprecise information, indicating the best course of actions required to improve collaborative decision-making processes.

Emergent Architectures of Open Source: A Conjecture

Darla V. Lindberg

The virtues of open source software projects—*hundreds doing what one cannot*—are not exclusive to software. The Internet excels at facilitating the exchange of large "chunks" of information—fast. As we learn to harness interdisciplinarity—decision fusion, disease spread, public health—we need to create a philosophy converging new methodologies, ethics, strategy, and technology. In so doing, we can unleash great innovations. The revolution of Linux isn't its success in the result *but in the method*. Tapping open source methods, this paper explores innovation, sans restrictive licenses and defensive intellectual property, in the emergent paradigm of the collective intelligence.

Intertextuality: A Hermeneutic Model in Milton's "Samson Agonistes"

Derek Wood

The insights generated by intertextual theory are an important contribution by post-modern theory to understanding meaning and verbal communication. One important model of intertextual communication is John Milton's tragedy *Samson Agonistes.* Analysis of the intertext can help resolve a controversy that criticism of "Samson• is locked in just now. The level of disagreement about what the play means is startling: is the hero's achievement a triumph of Christian morality, perhaps or is it a sinful, orgy of vengeful violence? An understanding of the play's intertextuality can help us appreciate its sustained multivalency held poised as it is in delicate suspension. The audience's uncertainty is deliberately fashioned by Milton's craft. "Samson Agonistes• is a masterpiece of creative indirection. It offers the reader unanswered and unanswerable questions. It enacts the problems encountered by the Christian in reading the Word of God, when that Word raises questions and uncertainties which are not clarified by the silent, Divine Author. The rewards for reading the divine text correctly were not earthly jouissance but eternal joy; the punishment for inept reading was eternal perdition. So the problems were significant. Those problems are integral to the meaning of the poem. Possible meanings intercross in the intertextual space on which "Samson• is written but the writer's voice is silent and he points to no one of these paths. We do not know how to read Samson's text let alone whether to adopt it as a model for moral action. "Samson Agonistes•, when it was written, was the latest stratum in the geology of the intertext, and its maker shaped it with great sensitivity to what lay below it.

Developing Relevant Technology for Small-scale Farming Population

Jennifer Taylor, Thomas Bellarmine, Dennis Timlin, and Vanimalla Reddy

GLYCIM/GUICS, a contemporary crop stimulation model, has been used to increase efficiency of crop management, yield prediction, increase profits, and manage resources on large –scale soybean farms. In an effort to develop and test efficient soybean models for small farmers in the mid south, USDA-ARS assigned a cooperative agreement with Florida Agricultural and Mechanical University, an 1890 Land Grant Institution. The majority of farms in the United States are small farms.

A Standing-order Protocol for Cricothyrotomy in Prehospital Emergency Patients

Evadne G. Marcolini, John H. BurtonJay R. Bradshaw, and Michael R. Baumann

To study utilization, indications, and outcomes associated with the use of a statewide, emergency medical services (EMS) standing-order protocol for cricothyrotomy. Methods. A statewide EMS database was queried for patients who received cricothyrotomy under a standardized, standing-order protocol. Patient EMS and hospital records were reviewed in a defined sequence with information recorded on a standardized collection form. Results. EMS records included eight years of practice with 1.5 million patient encounters. For each year studied, approximately 540 emergency medical technicians (EMTs) were certified to perform cricothyrotomy. State EMS providers performed a collective mean of eight cricothyrotomy procedures per year (range, 1–17), for a total of 68 cricothyrotomies performed within the eight-year period. Hospital records were available for review in 61 patients. Fifty-six patients received cricothyrotomy by open surgical incision, six by needle with jet ventilation, and one by both methods. Categorization of cricothyrotomy patients as trauma or medical was 61% trauma and 39% medical. Thirty-six patients (59%) were in cardiac arrest on EMS arrival and 12 patients (20%) died during transport. Thirteen trauma patients (21%) were admitted with eight patients surviving to discharge (13%). The neurologic impairment at time of hospital discharge was severe in four, moderate in two, and minimal or none in two patients (3%). Conclusion. A considerable percentage of cricothyrotomy procedures were performed on patients with non-trauma-related diagnoses in this investigation describing a standing-order EMS protocol for cricothyrotomy. The majority of patients undergoing cricothyrotomy with this protocol were in cardiac arrest at the time of cricothyrotomy, with a small minority of patients surviving to hospital discharge and fewer surviving neurologically intact. Key words: cricothyrotomy; emergency medical services; endotracheal intubation.

Management of the Citizen's Digital Identity and Access to Multi-version Norm Texts on the Semantic Web*?*

Fabio Grandi, Federica Mandreoli, Maria Rita Scalas, and Paolo Tiberio

This paper describes an ongoing research project involving the implementation of e-Government services on the Semantic Web. In particular, the project is aimed at managing the "digital identity" of citizens on the Internet, enabling them to benefit from "personalized" versions of the online services offered by the Public Administration, which can improve and optimize their involvement in the e-Governance process. The kind of service we will consider is the selective access to norm texts available on Web repositories. The project requires the defi- nition and maintenance of a citizen's ontology, the semantic markup and versioning of the stored norm texts which takes into account the actual applicability to different classes of citizens, the definition and enactment of Web services for the reconstruction of the citizen's digital identity and its classification with respect to the ontology, the design and implementation of a legal document management system for the selective access to personalized norm versions.

Performance Evaluation of VoIP using Fragmentation and Interleaving over Slow WAN links

Salman Bakhtiari and Fatima Ahmed

The voice and data integration presents a great challenge for today's internetworking environment. To reduce the rising communication costs, most of the enterprises are moving towards carrying voice traffic over the existing data networks with few enhancements, if necessary. As voice traffic is real-time, it asks for special treatment for timely delivery. A number of Quality of Service (QoS) issues come into picture in this kind of integration. These issues become more prominent when bandwidth is a bottleneck like on slow WAN links.

Revisiting Night John Teachers' Perceptions towards Cultural Lingusitic Diversity

Filiz Shine Edizer

I was first introduced to Night John by Gary Paulsen in a multicultural literature class while I was a doctoral student. The book had such a profound impact upon me that I use it frequently in my Language Arts, Social Studies, and Children's Literature undergraduate and graduate classes.. For those of you who are not familiar with Night John here is a brief synopsis of it.
Night John is a story about a young slave girl in the south and her trials and tribulations. Night John is brought into the plantation in a fashion not fit for humans, but he is a catalyst for change and ends up teaching Sarny one of the most powerful tools that can help her... which is reading. This is an empowering book filled with hope and courage and the strength of the human spirit.

e-Learning Development: From IT to ICT at the School of Clinical Dentistry, Sheffield

Giuseppe Cannavina, Christopher W. Stokes, and Cenwein Cannavina

The Information and Communication Technology (iCT) Project (started in 1999) took responsibility for the provision of Information Technology teaching in the dental school. In this time, through development by the iCT Project, and more recently by the Web-based Inter-professional Learning Network (WILeN), the course has been developed from the original taught technical programme focussing on computers, to a student centred information and communications skills course. The shift in emphasis has been driven by pressure from students to move away from a computer focussed course, and the shift in both technology and future requirements of dental professionals.

High Efficiency Microwave Power Amplifier (HEMPA) Design

W. Herbert Sims

This paper will focus on developing an exotic switching technique that enhances the DC-to-RF conversion efficiency of microwave power amplifiers. For years, switching techniques implemented in the 10 kHz to 30 MHz region have resulted in DC-to-RF conversion efficiencies of 90-95-percent. Currently amplifier conversion efficiency, in the 2-3 GHz region approaches, 10-20-percent. Using a combination of analytical modeling and hardware testing, a High Efficiency Microwave Power Amplifier was built that demonstrated conversion efficiencies four to five times higher than current state of the art.

Internet in Pharmaceutical Research and Education

Stefan Balaz

Pharmaceutical research, especially drug discovery, development, and design, profit from shared web-based access to: (1) public databases of genomes, protein sequences and structures, public databases of chemicals containing structures, properties, therapeutic and toxic effects, and curated knowledge bases for special protein classes; (2) public services for protein sequence alignment, structure prediction and evaluation of created structural models, and prediction of properties and biological effects of chemicals; and (3) collaborative software for selected user groups. Frequently, categories 1 and 2 are localized at the same web sites due to their complementarity. In education, web-based tools, which are most frequently used in drug research include: (1) simulators of drug-related processes like pharmacokinetics and chemical behavior; (2) teaching materials; and (3) class management software. Specific examples in each category are highlighted, with the aim to make the reader aware of the current status and refer him or her to the respective web sites for more details.

Relationship Among Relapse Rate, MMPI-2 Profiles and Employment Status of Persons Who Are Opiate Dependent

James F. Scorzelli

The purpose of this study was to determine if there was a relationship among the MMPI-2 profiles and the employment status of a convience sample of 51 persons who were opioid dependent and participating in a home detoxification program. Each participant was given the MMPI-2, demographic information gathered, and a follow-up was conducted six months after the initial contact. The results indicated that most of the participants did not maintain sobriety (67.6%), and that there was no relationship found between the MMPI-2 profiles and sobriety. However, the results of a discriminant function analysis indicated that only employment was a predictor in maintaining sobriety after six months. Although caution is advised in interpreting these results because the study did not use a random sample, the results were consistent with prior research on the importance of employment in the treatment of persons who are drug dependent.

Application of Internet Technologies in Teaching Natural Resources

Katta Jayaram Reddy

The objective of this presentation is to examine advantages and disadvantages of internet technologies teaching natural resources subjects such as water quality. There are several advantages associated with internet technologies. For example, students can actually see water quality data in a classroom on a real-time scale basis as it happens. Another advantage is internet technologies could enhance efficiency of teaching by providing effective tools. However, internet technologies may slowly replace traditional reading techniques such as reading science and engineering research articles in a library. This presentation, in

addition, will examine how internet technologies can minimize requirement of resources (e.g., paper, water) in teaching water resources curriculum

How plant leaves are protected from sunburn?

Kozi Asada

Plant photosynthesis converts solar energy to chemical one, and its products are the sole source of our foods, materials and energy. Plant leaves keep green for at least a half year under sunlight, even though our skin is sunburned for only several hours. Apparent little sunburn in leaves does not mean its absence, but is due to the effective systems to protect it. Under the conditions where photon energy is in excess of its utilization for photosynthesis, however, the leaves are susceptible to damages by reactive species of oxygen which are inevitably photoproduced in chloroplasts. Molecular mechanisms how the leaves are protected from photo-oxidative damages under variable, natural environments are overviewed.

The Evolution of Korea's Industrial Relations System and Change in the Wage-strike relationship

Mario F. Bognanno, Young-Myon Lee, and Michael L. Bognanno

For decades Korea's brand of state corporatism did not allow "free collective bargaining," but it did permit striking workers to be paid. We briefly review the evolution of post-1953 industrial relations in Korea, which discloses these facts and that in 1987 and again in 1997 Korea's industrial relations system was twice liberalized. Between 1987 and 1990 two important events transpired. First, there was the transition toward free collective bargaining; and second, the practice of paying striking workers was generally discontinued. These phenomena, and the long-standing business practice of keeping private information about firms' profits set up two empirical arguments which we examine: concealing profits from unions suggests an inverse relationship between negotiated wage settlements and strikes in Korea's manufacturing sector in 1988 and 1990; and since Korean firms generally pursued a "no work-no pay" strike policy by 1990, a reduction in wage settlement increases between 1988 and 1990 is suggested, given strike incidence and strike duration. Qualified evidence of a negatively sloped union resistance curve that shifted downward following implementation of the "no work-no pay" strike policy is found using 1988 and 1990 data sets compiled by the Korea Labor Institute, a research arm of the Korean Ministry of Labor.

Radio and Television of the Future: Intelligent Digital Indexing and Retrieval

Mark Maybury

This article describes advances in content based access to digital radio and television. We report novel methods in intelligent processing of audio, imagery, and text applied to search, processing, and presentation of information. We discuss methods for more natural and powerful information need expression using spoken language query, graphical or visual query, semantic query expansion, and multimodal query by example. We describe enhanced content processing that leverages progress in information extraction from text including extraction of named entities, relationships, and events. We leverage these developments in methods for multimedia segmentation, extraction, search, and summarization. Finally, we exploit user modeling and personalization methods to enable individualized custom displays. We illustrate these advances with examples from operational systems in content based access to broadcast news and audio hot spotting.

Northeast Regional Research Center: Information Technology for Enhanced Analysis

Mark T. Maybury

The Advanced Research and Development Activity (ARDA) established the Northeast Regional Research Center (NRRC) to engage the best regional talent to create solutions to some of the most vexing challenges facing analysts today. Central to this new research model is a series of challenge workshops addressed by collaborative teams across industry, academia, and government. Workshops have made novel contributions in the areas of reuse in question answering, temporal question answering, and opinion question answering, reducing variability in information retrieval systems, graphical annotation for temporal markup, scenario based question answering, and cyber indications and warning for the insider threat. This article reports key workshops accomplishment and lessons learned from this new model for research.

Using A Hierarchy of Determinant Attributes for Evaluation of Information Security Systems: the Case of Intrusion Detection System (IDS)

Sid Sirisukha and Mikhail Kotykhov

Intrusion detection system (IDS) has become an essential component of computer security in the organization. While IDS can provide multiple benefits for the effective information security, at the same time the implementation and maintenance of these systems can be a demanding and costly task for the management in the organization. The overall objective of decision-making as regards information security products (for instance IDS) is to select the most effective as well as the most cost-efficient among the competitive ID systems. The paper introduces the evaluation model of existing IDS. The main attributes of competing ID systems (NIDS and HIDS) performance are analyzed in a multi-criteria hierarchy with the inclusion of the main types of decision-makers and their objective as determinant factors. The comprehensive evaluation of the intrusion detection systems may facilitate the decision-making process for the company's management as regards the purchase of a particular information security product.

Evidence of Complex Reasoning in Technology and Science:
Notes From Inner City Detroit, Michigan, USA

Nancy Butler Songer

Educational research suggests that children's development of complex reasoning in science involves the simultaneous development of reasoning (e.g. formulating explanations) with scientific knowledge (e.g. interactions between animals in an ecosystem). While scientists utilize technology for the organization, analysis, and presentation of scientific data, children rarely utilize technology for these purposes. This paper presents results demonstrating complex reasoning in science possible among urban 11-13 year old students through the coordinated development of learner-centered technological tools (e.g. customized Internet resources; customized software for hand-held computers), activities that foster complex reasoning, and assessments to evaluate complex reasoning in science and technology.

Mechatronic Vocational Education

G. Kaynak , I. Gucuyener and E. Emel

In the very quickly changing marketplace of today, the manufacture of sophisticated products that are capable of accomplishing many functions without any errors is increasing very rapidly. Design and manufacturing of these products need to be done by a multi- and interdisciplinary infrastructure that comprise mechanical, electronics engineering and computer technology. Mechatronics is the new discipline that meets these challenges synergistically integrating the stated fields in the design and manufacturing of

the sophisticated products and processes. As to Mechatronics Vocational Education, it prepares Mechatronics Technicians to install, program, operate, maintain, service, and repair automated manufacturing systems including robots. This paper presents a Mechatronics Vocational Education curriculum and the course contents briefly.

Distance Learning Programs: Mapping the future in Geospatial Information Technology

Pamela B. Lawhead, Srinivas Chappidi, and Keyur C. Patel

The development of an effective learning network must utilize the collective union of advanced technology. The result is a repository of online courseware written by content experts enhanced by technology and delivered via the Internet, in an interactive state-of-the-art, learner-centered, multi-modal environment. This paper summarizes the challenges faced in developing effective online courses in the field of Geospatial Information Technology (GIT). The goal will be accomplished by integrating three online educational approaches: expert-lead, self-paced, and collaborative efforts. Snapshots of the course modules developed in this process are also included.

The Design and Piloting of an eBusiness Design Studio

Paul Robins and Doug Love

This paper describes the establishment and early use of an eBusiness Design Studio in Aston Business School at Aston University which is located in Birmingham in the UK. It was originally conceived as an R&D aid as much as a teaching resource. However the bulk of its use to date has been in the support of Masters level modules (courses) and this description will focus on that application in the first instance. We have less experience of its use in an R&D context but we will make some preliminary comments on this in a later section.

An Artifactual Information System (I-MASS) as an Agent-Based Open Service Architecture: Using a Knowledge Landscape with a *Virtual* Reference Room

Peter J. Braspenning, Gabriel Hopmans, Peter-Paul Kruijsen

For about a decade a trend has become noticeable to digitally open up the worlds of museums, archives and libraries by allowing *online* access to cultural heritage information in diverse locations. In the same period we have become more aware that cultural heritage institutions are in fact knowledge *providers*. Our European IST Research Project (acronym: I-MASS) intends to provide human- and knowledge-oriented *navigation* mechanisms for traveling through this knowledge landscape *of the present and past* that is constituted by uniform and transparent access to the cultural heritage sources provided by archives, libraries and museums. Moreover, it introduces the concept of the Virtual Reference Room (VRR) in order to support the user in following *layered* and *cross-layered* navigational paths by less or more extensive use of a variety of *Reference Works*. We connect Cultural Heritage providers with their (heterogeneous) sources to the system. Moreover, in order to successfully tackle problems of *syntactical and semantical interoperability* we establish a uniform access layer to these sources that effectively removes (parts of the) heterogeneity of the sources.
The I-MASS core system mediates between the users and cultural heritage sources. It contains a knowledge repository (Knowledge Landscape) that is partly pre-formed and partly dynamically constructed. The Knowledge Landscape is *normatively* used in propagating a query to the suitable sources and any necessary translations to the conceptual schemas of the pertinent sources are done 'en route'.

Designing a Scalable, Flexible and Possibly Mobile Centre of Emergency Operations, by making use of Recreational Parks and extensive and innovative use of Ordinary Steel Shipping Containers

Peter P. F. Chan

The World, especially Hong Kong suddenly faced the onslaught of SARS, Hong Kong lost the battle with 299 deaths, financial and economic billions and political turmoil in which ministers can hardly account.
Not many countries, even the US, establish the Emergency Operations Centres because it is simply a waste of resources when nothing happens. The reason is that there are not many disasters and no one can predict when they may strike. The Emergency Operations Centre, in the author's mind, is a flexible project which attempts to make use of recreational camps in Hong Kong. In fact it may be anywhere. His project is attempting to involve and mobilize and "pre-equip" these camps for emergency use.

Chaos-order Mutuality that Generates Creative Learning

Donald B. Pribor

Energy is the core idea for understanding physical changes. Energy has two aspects: 1. potential and 2. flux. Potential, when applied to a system or applied to a system's environment, represents Order and the possibility of generating a type of event. Flux is the way energy as potential manifests itself. Energy flux leads to one or both of two kinds of change: 1. motion, i.e., change of location in space and 2. change in temperature. Energy flux leading to motion is called work and energy flux leading to change in temperature is called heat. Potential representing Order "points to" sequential, reversible changes of structure in which time is reversible and Order is conserved. That is, at any moment during these changes Order never is lost. Rather the disappearance of Order associated with one event is coupled with the emergence of a new and equal degree (quantity) of Order of the sequential next event. For example, in the ideal sea saw, as one person goes down, the other person goes up; the quantity of going down equals the quantity of going up. *The conservation of Order means that there is no Chaos*.

INN RESEARCH.COM. Developing a Sustainable Web-Based Research Network for the Hospitality Industry in the United States

Robert Palmer

With the advent of the Internet, the world of research has been changed forever. Although many claims have been made about the use of the Internet and web based surveys, this initiative has showed how a joint research initiative founded by both commercial and educational partners can bring together a fragmented industry. Through the development of a database driven research panel, results are provided to respondents within days of survey completion. This timely delivery of results has enabled members to use this information in adjusting to the ever changing operating environment and challenges facing the Hospitality industry.

Can the web really boost your marketing effort?

Rod Curnow

Which industries are best suited to using the web; Usage based segmentation; Strategic implications; Some case studies on what's worked and what hasn't.

Virtual Peace Education (EES)

Ruth Firer

This paper is based on the convictions that Peace Education (PE) is the basis for any sustainable univalent relations between parties in a conflict, and that Virtual Peace Education (VPE) is almost the only practical way to practice Peace Education in open violent conflict as is the current Israeli / Palestinians one. The author believes that VPE has also an independent rationale that justifies its merits as another model of PE, in Post Conflict process of Healing and among parties in societies torn by rifts and problems.

New Algorithm of Discriminant Analysis using Integer Programming
- **OLDF (Optimal Linear Discriminant Function) will open new frontier of discriminant analysis and SVM -**

Shuichi Shinmura

In this paper, I introduce two optimal linear discriminant functions (OLDF) using the integer programming (IP) and linear programming (LP). Those are called IP-OLDF and LP-method. In order to evaluate these new methods with the Fisher's linear discriminant function and the quadratic discriminant function, I apply these methods to the iris data, the medical data and the 115 internal and external data sets of the 2-dimensional normal random data. The sample error rates of each method are analysed by many statistical methods, especially t-test and the regression model. Namely, those of LP-method, Fisher and Quadratic discriminant functions are regressed and evaluated by IP-OLDF. Both results of t-test and the regression model show us that IP-OLDF is very useful and will offer new knowledge for the discriminant analysis and SVM in future.

Developing an internet-based program to improve the dietary habits ofolder persons

Linda Snetselaar

This project will develop an internet-based program to improve the dietary habits ofolder persons. Our program will be a significant advancement over existing Internet dietary products, such as those available through the American Heart Association, the U.S. Department ofAgriculture, or Weight WatchersTM. Those programs are not based on Stage of Change and are not geared to meeting the needs of older persons. This nutritional intervention will be novel in several ways: 1). It is tailored to meet the unique nutritional needs ofolder persons; 2). The internet-based approach facilitates delivery of a customized, self-directed nutritional intervention based on motivational theories developed through Dr. Snetselaar's extensive experience with dietary interventions; 3). The program will utilize the computer and internet experience ofDr. Stumbo and be extensively pilot tested for acceptability and ease ofuse in seniors and pilot tested for efficacy; and, 4). The internet-based approach facilitates delivery ofnutritional advice to seniors who have difficulty accessing in-person nutritional counseling for a variety ofreasons, including distance from providers, transportation problems, being home- bound, living in underserved areas, or financial reasons.

Internet activity and its effects to competitiveness in emerging countries

Richard Szanto

Most researches and studies investigate the e-business experiences of western economies, and only few of them try to map other countries' observations (see Hempel and Kwong, 2001, Damaskopoulos and Evgeniou, 2003, Teo and Ranganathan, 2004). Latter researches mainly justify those assumptions that in emerging countries the level of e-business adoption is more modest than in western countries due to several reasons.

The Ntikuma syndrome: ICT-supported mediation of local knowledge and its global benefits

Thomas Bearth

Access to ICT has become a crucial aspect of demarginalizing local communities across the world. But unlike the unidirectional move characterizing e.g. the outreach of food aid to the underfed, the *synthesis of local and global knowledge*, itself a prerequisite to sustainable development and global survival, presupposes a two-way communicative process based on communicative equality across cultural and linguistic boundaries.

The paper presents a model of cross-cultural research tele-cooperation being developed by the African languages e-learning program at the University of Zurich and currently being field-tested in Africa. Its main foci are:

(a) empowerment of local experts to share their knowledge without fear of alienation due to linguistic discrimination (the *Ntikuma* principle);
(b) cost-sensitive language-engineering for overcoming the digital divide "from the far end";
(c) a plea for a "linguistic turn" in Third-World-centered research.

Human, Gender and Environmental Security: Huge. An Utopian Paradigm

Úrsula Oswald Spring

The end of the Cold War coarsely exposed North- South differences, and in the South it revealed the disparity between social classes, ethnic and religious groups, urban and rural zones, and especially gender-based discrimination. The development paradigm is getting homogenized by a process of globalization, characterized by instant world communication, financial flows and an increasing interdependence in trade and controlled by multinationals enterprises. Free market ideology, private competition and an increasing process of privatization, linked to a shrinking state intervention, are stated as the motors of growth. The mortgage of this economic model of late capitalism, which concentrates income and wealth through unemployment, expulsing youth and elders from the labor market, managed by a superpower, its allies, reinforced by military superiority, and sustained by a homogenizing culture, based on consumerism and mass media manipulation, has created four main conflictive situations*: poverty, physical violence, discrimination and environmental destruction*.

Web Based Introductory Course in Electrical Engineering

Vello Kukk

Fully web-based course called Circuit, Systems, and Signals has been delivered over past three years to large student groups (150 students). The course contains all major components (lectures, exercises, labs) and in most actions students have been given maximum of freedom (free registration to labs and quizzes), all the results have been recorded in databases. General descriptions and formal parameters of the course along with numerical data concerning numbers of different actions are given. Analysis of collected data and changes in students' opinions are presented. Some critical conclusions are given concerning the role of lectures and lab works are made.

Streaming Content DRM system for MPEG-2

Yeonjeong Jeong, Jeonghyun Kim, Kisong Yoon, and Jaecheol Ryu

In this paper, we propose the streaming content DRM system for MPEG-2 streaming media which can support content streaming with content protection and rights management. We design an encryption scheme which can be applied to MPEG-2 transport stream (TS). The encrypted stream is compliant to MPEG-2 TS format so that it can be streamed by any MPEG-2 streaming server. Proposed system can protect attacks over network since streaming server streams pre-encrypted content and enables client decrypts the streamed data and playbacks it in real time.

A Mechanism for Switching Running Mode of Application Programs

Yoshinari Nomura, Kazutoshi Yokoyama, Hideo Taniguchi, and Katsumi Maruyama

This paper presents a new mechanism for reducing the overhead about processing in which a lot of system calls are issued. The proposed method changes the process of an application program running in the user mode to the process running in the supervisor mode at any time. In a word, the process can use two running modes of the user mode and the supervisor mode during executing the application program. The application program running in the supervisor mode uses the system call by the function call. As a result, the overhead of the system call processing can be reduced by executing the process in the supervisor mode for the application program to which e.cient execution is required.

SwanLink Network Application

Fred B. Holt, Virgil Boussa, Andrija Bosnjakovic, Nenad Korolija, Predrag Minic, Jovan Popovic, and Aleksandar N. Stanic

This paper presents a new intensity-based technique for interactive teaching over the network. The goal of this project is to develop a network layer for P2P communication between network nodes. Application provides environment in which potential users are informed about what other users are working on their workstations. Each user can draw, input text and images, and post that to other users on the network. The paper discusses several practical aspects of problems that affect the accuracy of the method and proposes some solutions.

MPEG1/2 Multiplexer

Jelena Krunic, Nenad Korolija, Zoran Babovic

MPEG Multiplexer os software tool for multiplexing MPEG video and MPEG Audio Streams into an MPEGSystem Stream. It is full implementation of ISO/IEC 13818-1 (MPEG2 System) and ISO/IEC 11172-1 (MPEG1 performance. An easy interface is provided to the programmer which wants to exploit this software in own Project. Both version, for Windows and Linux, are available.

Data Assurance In Conventional File Systems

Aleksandar N. Stanic, Sasa M. Rudan, and Aleksandra Z. Kovacevic

In, now, not so recent time, rapid and extensive growth in computer technology creates an urging need to develop several newer tchniques to protect content integrity, copyright and ownership of digital data. This presentation outlines digital signature and watermarking techniques and surveys the current state of mentioned research highlighting the technologies that are applicable for arbitary type of files stored in a convetional file system on disk.

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Processing Asymmetries

Anna Maria Di Sciullo

This paper provides evidence to the fact that information processing on the web can be significantly improved by integrating a linguistic theory whose primitives are the structural and semantic relations established between pairs of constituents, such as the **A**symmetry Theory (Di Sciullo, 2004).
Advanced Web Engineering should provide a system optimizing the access to entities (simple and complex objects) expressed in natural languages. While multimedia may offer a representation of the entities, in certain cases this is not possible, for example, for abstract entities and quantified expressions. Furthermore, current search engines based on keyword search and using stochastic methods and Boolean logic, are not optimal with respect to the search and retrieval of entities the description of which requires complex nominal expressions. We show the limits of web search engines in this respect. We provide evidence that asymmetric relations are central to the internal structure of nominal expressions and that they must be preserved, up to meaning preserving equivalence, for optimal access.
We demonstrate that asymmetric relations can be incorporated in a parser for the analysis of nominal structures underlying the denotation of complex entities. The incorporation of the parser in a web search engine allows a fine-grained access to entities, simple and complex. We present the main features of an Information Retrieval and Extraction system based on natural language asymmetric relations. We show that, along with the identification of functional elements, asymmetric relations contribute to improve the performance of search engines. We compare an Information Retrieval and Extraction system based on the recovery of a subset of asymmetric relations with current operating search engines based on keyword search and Boolean analysis. We show the superiority of the first system. We show that natural language asymmetries constitute a crucial ingredient of Internet Infrastructures ensuring greater precision to internet communication.

Symmetry Breaking and Entropy in Grammar

Juan Uriagereka

What we may think of as a 'Symmetry Breaking' clause in UG pertains to the motivation of transformations, allowed to apply only when their action results in a consequence C (broadly, "last resort"). C may, first, be derivational C_D or representational C_R. Among C_D's we could have the conditions in (1) and among C_R's at least those in (2):

(1) a. The desire to implement the most local moves (e.g. P-feature in conditions of successive cyclicity).
b. The desire to maximize derivational options at any given point in the derivation (e.g. conditions favoring scrambling/doubling if possible).

(2) a. Unqualified conditions (e.g. Quantifier Raising if new scopal possibilities, cliticization if new prosodic/stylistic situations).
b. Enlightened Self-interest (to salvage a derivation where either source or target of transformation are affected (e.g. Attract).
c. Greed ((2b) narrowed down to instances where only the transformational source is involved (e.g. pure Move)).
d. Suicidal Greed (a version of (2c) where [the displaced element/the element that gets valuated] –at any rate, a feature– gets erased after the valuation under conditions of identity matching).

For either C_D or C_R, there is a very real sense in which, if successfully achieved, the transformational process T in these conditions meets two criteria:

(3) a) T breaks the symmetry of the structure existing prior to T.
b) Nonetheless T is only one (sort) among a class of potentially unlimited Ts.

(3a) pertains to pre-transformational structural conditions being 'symmetric': obvious in LCA instances (for c-command conditions) and arguable for any phrasal instance (if (external) Merge is symmetrical and transformations (generally, Internal Merge) are asymmetric). (3b) pertains to both limiting and motivating the class of transformations that could break phrasal symmetry (qua limiting conditions, (1a) is more limiting than (1b), and the conditions in (2) get more limiting as we descend on the sub-cases).

Taken as a whole, conditions (1) and (2) may not be incompatible, in which case an issue arises at to how C_D is 'ranked' vis-à-vis C_R coupled with economy conditions (e.g. directly limiting the number of transformations in a given reference set). Note in that respect that C_D is a global computational condition evaluating derivations (roughly akin to the Law of Entropy determining natural systems), whereas C_R (plus regular economy conditions) is a local condition on when a given transformation is allowed to proceed. If so, it should be the case that C_D trumps C_R, assuming we are taking the language faculty to be a natural system, thus subject to natural ordering conditions (for instance, the Slaving Principle in Synergetics has to work within the confines of the Second Law). Interestingly, this conjecture is testable with first order data, the puzzle in (4)/(5):

(4) a. ?* *There were [t arrested men]*
b. *There were [men arrested t]*

(5) a. *There seem [t to have been [men arrested t]]*
b. * *There seem [men to have been [t arrested t]]*

The standard Merge-over-Move (MoM) condition predicting (5a) over (5b) incorrectly predicts (4a) in favor of (4b). However, what we may think of as an entropy-based analysis, where entropy is defined as in (6), leads to the opposite result:

(6) Derivation D is more entropic than derivation D′ if D leads to more putative alternative convergent derivations than D′.

In other words, the derivation allowing more derivational options beats its competitor(s). It can be easily shown that the structure *men arrested t* in (4b) is more entropic than *there arrested men* in (4a) (further continuations of that (4b) chunk allow, after the insertion of *were*, either another movement of *men* or insertion of *there*; in contrast comparable continuations in (4a) would only allow the movement of *there*, since *men* couldn't move over *there*). So an entropy-based condition correctly predicts (4a) to be grammatical in detriment of (4b), of course only if such a condition is evaluated prior to MoM. In addition, it must be that MoM is allowed to eliminate (5b) in favor of (5a), which must mean that entropy conditions are neutralized in this instance. Entropy evaluation must thus be sensitive to substantive lexical choice, as opposed to the MoM metric:

(7) A derivation D is comparable for entropy with a derivation D′ only if D and D′ share both the same derivational horizon and the same substantive lexical items.

Given (7), what disallows application of the entropy condition to (5) is the fact that, for the comparison of future derivational fates to take place, the addition of in particular *seem*, a substantive lexical item, must take place. Since that changes the entropy metric, the derivations are comparable only up to the point of that lexical insertion, and thus have equal entropy. In other words, (7) ends up ensuring locality for entropy consequences.

Conditions on transformations, in general, argue for the reality of these rather abstract objects. Curiously, Symmetry Breaking clauses (seen together with more familiar Conservation and Locality clauses) have a family resemblance to conditions apparent in equations describing fluid dynamics and other physical systems. It is thus worth exploring whether the phenomenon of symmetry breaking in grammar, observable even with first-order data, isn't anything but a reflex of symmetry breaking in other natural systems more generally. If so, an entropy-based approach, coupled with dependent ordering conditions, ought to be seen as a welcome step in understanding both why language has transformations and what consequences these objects have for language morphology more generally. Moreover, if this order-of-things is reasonable, perhaps we ought to expect C_R conditions to have emerged within linguistic architecture (arguably as computational heuristics) within the confines dictated by C_D conditions.

Possible Extraction Domains and Move/Re-Merge as an Asymmetric Relation

Anna Maria Di Sciullo and Dana Isac

(1) illustrates the classic CED effects originally observed in Huang 1982.

(1) a. Which politician did you see [pictures of_]?
b.*Which politician did [pictures of _] upset the voters?

Traditional analyses of (1) have related the contrast between (1a) and (1b) to the subject vs. object status of the DP from which extraction takes place (Chomsky 1986). However, as discussed in Di Sciullo, Paul and Somesfalean (2003), there is crosslinguistic evidence (Romanian and Malagasy data) that extraction is possible from subjects. Moreover, as shown in (2), this is possible even in English:

(2) a. There is a description of Aristotle in the book.
b. Who is there a description of in the book?

Other accounts of (1) have capitalized on the specifier vs complement position of the DP from which extraction takes place. Kayne 1994 reanalyzes the relation of specifier as a case of adjunction. The ungrammatiality of (1b) would thus follow from the ban on extracting from adjuncts. Uriagereka and Nunes 2000 assume that all specifiers must be Spelled Out (sent to PF) separately from the other elements in the structure (i.e. separately from heads an from complements). This implies that no syntactic operation may access the internal parts of Specifiers. This would explain the ungrammaticality of (1b).

However, (3) shows that extraction from a Specifier position is possible and thus that it is not the Specifier status of the DP from which extraction takes place that is responsible for the ungrammatiicality of (1b).

(3) *Cine$_i$ e imposibil* [t$_i$ *sã citeascã t$_i$ ziarul dimineata*]? (Romanian)
who is impossible SÃ read paper-the morning-the (Di Sciullo, Paul, Somesfalean 2003)

We propose that what is relevant is whether the DP from which extraction takes place has undergone movement or not. In our view, CED effects are part of a more general constraint on extraction from dislocated XPs.

(4) No overt or covert extraction may apply to the internal parts of a moved XP.

This is illustrated in (4) and (5), for overt extraction, and in (6), for covert extraction.

(4) a. A description of Aristotle is in the book. c. There is a description of Aristotle in the book.
b. *Who is a description of in the book? d. Who is there a description of in the book?

(5) *Cine$_i$ e imposibil* [t$_i$ *sã citeascã t$_i$ ziarul dimineata*]? (Romanian)
who is impossible SÃ read paper-the morning-the
**Cine$_i$* [t$_i$ *sã citeascã t$_i$ ziarul dimineata*] *e imposibil*? (Romanian)
who SÃ read paper-the morning-the is impossible (Di Sciullo, Paul, Somesfalean 2003)

(6) **no QR out of a moved XP (Scope freezing)**
Topicalized XPs are "frozen for scope" (Barss 1986, Sauerland 1997); quantifiers inside a topicalized XP cannot take scope outside the topicalized XP
a. ...and **a policeman** stood in front of **every bank** that day ∃»∀; ∀»∃
b. ...and [$_{vP}$ stand in front of **every bank**] **a policeman** did that day ∃»∀; *∀»∃

In (6b), even if the VP reconstructs in its base position, the QP 'every bank' does not regain its initial scope properties (compare to (6a))

The proposed explanation for the fact that moved XPs are not possible extraction domains has to do with the proerties of AGREE. Together with Chomsky 2000, we assume that Move involves AGREE. Also, as proposed in Di Sciullo 2003, we assume that AGREE is not a relation between individual features, but a relation of proper inclusion between sets of features.

(7) Given two sets of features φ1 and φ2, AGREE (φ1, φ2) applies if and only if φ1 properly includes φ2 (Di Sciullo 2003)

We propose that the proper inclusion relation that defines AGREE must hold not only in the syntax, but also at the interfaces. i.e. at PF, and at LF. Extracting out of a moved XP would result in a disturbance of the proper inclusion relation at PF (given that the phonological features would be 'extracted') and also at LF (given that quantifier features would be 'extracted by Quantifier Raising).

Parataxis as a Different Type of Asymmetric Merge

Mark de Vries

The problem. A syntactic derivation is based on two major asymmetries: the asymmetry between sister nodes, which is translated into precedence at the PF interface, and the asymmetry between mothers and daughters, which causes hierarchy (dominance) and – indirectly – c-command, which is used in syntax and/or at the LF interface. Merge, as it is presently defined, automatically leads to subordination. Therefore it is quite unclear how we can deal with parataxis in the broad sense, such as parenthesis, apposition, interjection and coordination, the reason being that there are substantial differences between subordination (=hypotaxis) and parataxis; see below. Although there are proposals for common coordination (e.g. Kayne 1994), other types of parataxis are generally neglected in formal syntax. Notice that paratactic material is linearly integrated in the matrix structure; therefore it must be connected to its surroundings before Spell-Out (and not on some 'discourse level'). So we arrive at two fundamental questions: How can the non-subordinative properties of paratactic constructions be represented in syntax? Can we generalize over coordination and other types of parataxis?

A different class of asymmetries. We argue that there is a general pattern: if A is paratactically construed with respect to B, no constituent from A can move to B, or be anaphorically dependent on some constituent in B. An example is the minimal pair in (1) and (2), where variable binding into a relative clause is tested:

(1) Everybody$_i$ was talking about the museum that he$_i$ visited yesterday.
(2) * Everybody$_i$ was talking about the Louvre, which he$_i$ visited yesterday.

The restrictive relative in (1) is hierarchically embedded in the main structure, and variable binding is fine. The appositive relative in (2), however, is paratactically construed, and the c-command relation is precluded (cf. Demirdache 1991 for similar facts). The same effect occurs in parenthetical sentences; see (3):

(3) * Everybody$_i$ – (and) he$_i$ just arrived – was talking about Hank.

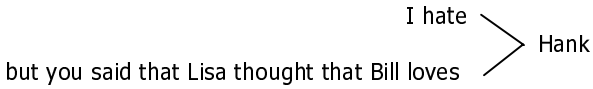
Furthermore, we predict that extraction from a second conjunct is never possible, although we know that the Coordinate Structure Constraint does not apply to semantically non-parallel coordination (e.g. Culicover & Jackendoff 1997); see (4) versus (5):

(4) How many courses can we expect our graduate students to teach _ and (still) finish a dissertation on time?
(5) * What did Mary finally overcome her inhibitions and ask John _ ?

We will show that this asymmetry is systematic on the basis of movement and anaphora data from Dutch. Thus, second conjuncts and other paratactic material are in a way 'invisible' for the context. These facts are in line with Progovac (1998), who argues that there are no c-command-based relations between conjuncts.
Theoretical proposal. We think that a fundamental solution is needed in order to incorporate the properties of parataxis in the grammar. In a nutshell, we propose that there is a second kind of Merge, which establishes an inclusion relation that blocks c-command. In representational terms, this amounts to the addition of a local relation called 'behindance' to the more familiar dominance and precedence. We will show that the asymmetries mentioned above follow straightforwardly from these assumptions.
Further consequences. Clearly, the proposal opens up a whole new domain of research. We will discuss the emergent problem of the linearization of syntactic structures complicated by the 'behindance' relation at the PF interface. We will also consider the possibility of 'shared' constituents (cf. Van Riemsdijk 1998), which implies the additional assumption of 'remerging' a constituent. We show that this process is theoretically restricted to coordination. **Example.** Right Node Raising is a relevant case. It seems that some crucial differences between forward deletion and RNR can be explained, such as the presence resp. absence of locality effects; see (6) vs (7):

(6) * I *like* APPLES but you said that Lisa thought that Bill _ PEARS. [gapping]
(7) I HATE _ but you said that Lisa thought that Bill LOVES *Hank*. [RNR]

In (7), the verb *hate* in the first conjunct is locally related to the direct object *Hank*, which surfaces in the second conjunct, as is informally sketched in (8):

(8)


In this way the domain boundaries in the second conjunct are bypassed.

The asymmetry of *only* and *nur,* Conservativity, and the syntax/semantics interface

Elena Herburger

We know that sentence meaning is compositional, a function of the meaning of items in the array and their syntactic arrangement. We further hypothesize that sentence meaning is strongly compositional in depending only on the very local syntactic relation of sisterhood. Given (strong) compositionality, we can use semantic interpretation to probe the syntactic structure of the sentence. In this talk, I discuss the quantificational structure of focus particles like *only*. Taking into account (i) that the fact that *only,* like other proportional quantifiers, denotes an asymmetric relation and (ii) Conservativity, I argue for an LF structure that is derived by Q-raising and Focal Mapping (Herburger 2000). I further suggest that the Q-raising of *only* that I posit on interpretive grounds for English is overtly realized in German.

Like verbs, determiners denote relations, though not relations of individuals but of pluralities of individuals. All determiners can be viewed as denoting two-place relations, dividing into intersective, symmetric ones (e.g. *some* and *no*, cf. Val (<X,Y>, *some*) iff X ∩ Y = {}) and proportional, asymmetric ones (e.g. *every, most*, cf. Val (<X,Y>, *every*) iff X ⊆ Y)). Symmetric determiners can be recast as unary relations, but asymmetric ones cannot. *Only* behaves in relevant respects like *every,* denoting an asymmetric, necessarily binary relation.

Unlike in the case of verbs, the arguments of determiners are partially derived. In (1), the internal argument of *every* (= *yellow flower*) denotes its 'restriction', but the second argument, which denotes the 'scope', only comes about as a result of QR of the entire noun phrase to clause-initial position: *every* in (1) relates the class of yellow flowers to the class of things Isabel picked in such a way that whatever element belongs to the first class also belongs to the second class. The fact that a Q's first argument (=NP) universally denotes the restriction (and not the scope) is called Conservativity ([[Q A] B] iff [Q A] B ∩ A).

(1) Isabel picked every yellow flower.

(2) [[every [yellow flower]] Isabel picked t]

The quantificational structure of *only* is even less transparently spelled out than that of *every.* Consider (3). Here *only* relates the class of flowers that Isabel picked to the yellow things, requiring that all flowers Isabel picked were among the yellow things.

(3) Isabel picked only YELLOW flowers.

The truth-conditions follow and, importantly, the interpretation is conservative if (i) *only* undergoes Q-raising, moving to a clause-initial, adverbial-like position and then (ii) Focal Mapping applies: the non-focused material in the c-command domain of the raided *only* is copied as an internal argument of *only,* making *Isabel picked YELLOW flowers* the external argument:

(4) [[Only [Isabel picked flowers]] Isabel picked YELLOW flowers]

Thus, given the asymmetric meaning of *only* and strong compositionality we know that *only* must have two arguments at LF: the correct argument structure and a conservative interpretation does not follow on any version of QR but requires the more radical Q-raising and Focal Mapping.

Independent evidence for Q-raising comes from German. Going back to Jacobs (1983, 1986) *nur* is argued to be base-generated as an adverb. As I will show, this, in combination with scrambling offers a very plausible account of the behavior of *nur* in the *Mittelfeld* its extension to *only* in the *Vorfeld* is less obvious. In particular, it requires giving up the V2 Constraint in *only*-initial clauses and allowing for V3 in that case. Recently, Buering and Hartmann (2001) have argued that this price is worth paying because *only* in clause-initial position cannot reconstruct even when the noun phrase that contains its focus reconstructs.

(5)	Nur	ein	Bild von seiner FRAU	besitzt	jeder	Mann.
	Only	a	picture of his wife	owns	every	man

On the account I am proposing the 'adverbial' appearance of *nur* in German is the result of overt Q-raising. I show how this explains the datum in (5) while at the same time maintaining the V2 constraint in its traditional form.

Minimalist Parsing and Multiplanar Syntax

Sandiway Fong

In this paper, we discuss the problems posed for parsing systems in the Minimalist Program (MP) by the asymmetric operation of adjunction.

Chomsky (2001) proposes a multiplanar account in which arguments and adjuncts are separated into non-interacting planes of structure in narrow syntax. Adjunction of an adjunct B to A is implemented by a pair-Merge operation that forms the ordered pair <A,B>, keeping A and B on the argument and adjunct planes, respectively. The two planes, and A and B, subsequently come together during TRANSFER, the operation that hands narrow syntax derivations off to the phonological and semantic components. More specifically, this is carried out by SIMPL, a sub-operation of TRANSFER. Chomsky (2001) argues on the basis of reconstruction facts as illustrated in (1) that the strict cycle in the MP can be maintained, and devices that violate the strict cycle such as Late Insertion are unnecessary.

(1) a. Which picture of Bill that John liked did he buy
    b. Whose claim that John is nice did he believe

In (1a), linking the pronoun 'he' to 'Bill' produces a Condition C effect, but linking to 'John' does not. Assuming the copy theory of movement and that adjunction applies in the case of relative clause constructions, (1a) has the structure given in (2).

(2) [which [[picture of Bill][that John liked]] did he buy [which <[picture of Bill],[that John liked]>]

SIMPL linearizes pair-Merged components for spell out. Following Carnie et al. (ms.), SIMPL applies to the head of the wh-movement chain but not to the copy in root position, which remains unpronounced. The pronoun 'he' resides on the argument plane and thus cannot bind 'John' in the unlinearized and unpronounced copy, and hence there is no condition C effect. However, 'he' may bind 'Bill' in 'picture of Bill' since this component of the pair-Merge resides in the argument plane, and thus there is a condition C violation. In (1b), unlike the relative clause case, there is no pair-Merge since 'that John is nice' is an argument of 'claim'. As both elements reside on the argument plane, there is a condition C effect for 'John' and 'he'.

We describe a parser based on Fong (2004) that implements the multiplanar pair-Merge account. In this framework, parsing proceeds strictly on a strictly incremental, left-to-right basis using operations based on elementary trees. In the multiplanar version, the parser composes elementary trees, shifting from the argument to the non-argument plane and back again as necessary. An initial shift from the argument to the adjunct plane will be triggered when a non-selected element is encountered in the input. A shift back to the argument plane occurs when elementary tree selection is exhausted.

We consider the implications of the multiplanar approach in the case of pro-Drop head-final languages such as Japanese and extend the implementation to handle cases where the parser must invert or flip planes. For example, in a Japanese relative clause construction, the nominal head will follow the modifying clause. Assuming no lookahead, a parser cannot know that the modifying clause is not a simplex clause until after the clause has been parsed and an unexpected nominal head is subsequently encountered. In this case, the parser must invert states and flip the clause that was initially processed in the argument plane to the adjunct plane.

Finally, the multiplanar analysis also has computational advantages. It will be shown that the pair-Merge account is superior to and involves fewer choice points than one based on Late Insertion.

Combinatory categorial theory of grammar

Mark Steedman

The paper presents a combinatory categorial theory of grammar which directly and compositionally maps the level of phonological form onto that of logical form using a lexicalized grammar and a universal combinatory computational mechanism. Phenomena involving long range syntactic dependencies and semantic operator scope are captured by direct combinatory projection from the lexicon. In the terms of the Minimalist program, "movement" (both overt and covert) is subsumed under "merger". This system will be illustrated using a case study of the interaction of coordinate structure, quantifier scope, and intonation structure.

Isolability at the Interfaces and the Notion of Binding Domain

***C**alixto Aguero-Bautista*

The standard binding theory proposed in Chomsky (1981) predicts that anaphors (reflexive pronouns) and regular pronouns should have a complimentary distribution. Although regular pronouns and reflexives are, in fact, in complementary distribution in many syntactic environments, examples like those in (1) and (2) show that this is not always the case. This fact has led a number of researchers (e.g., Reuland and Reinhart 1993) to abandon the standard binding theory and the notion of c-command underlying it.

(1) a. Max saw a gun near himself/him.
b. Lucie counted five tourists in the room apart from herself/her.
(2) a. Lucie saw a picture of herself/her.
b. Max likes jokes about himself/him.

In this paper I will argue that the standard binding theory can be improved if we modify our view of what count as a binding domain. In particular I will argue that for a domain to count as a binding domain, the given domain must be an independent unit at the LF interface. I will also argue that there are two types of binding domains: those that are propositional (e.g., CPs, and VPs) and those that are not. I will call the first type the strong binding domains and the second type the weak binding domains. I will show that if we modify the binding conditions as in three we will be able to account for all the cases that the standard theory accounts for as well as the problematic cases in (1)-(2).

(3) Binding Conditions
A: an anaphor must be bound in the minimal strong binding domain in which it appears at LF.
B: A pronoun must be free in the minimal binding domain in which it appears at LF.

I will argue that the difference between anaphors and pronouns is that whereas the former needs to be bound in their minimal strong binding domain, the latter only needs to be bound in the minimal domain that qualify as a binding domain be that strong or weak. The anaphor in sentences like (1), for instance, is fine because it is bound in the vP by the trace of the subject. The vP is the binding domain for the anaphor, being the minimal strong domain containing the anaphor. On the other hand, the pronoun in (1) is OK because it is free in the PP *near himself,* which will qualify as a binding domain, being an independent unit at LF. In an example like 4, below, the situation is different:

(4) John$_1$ hit himself$_1$/*him$_1$

Here the only binding domain containing the anaphor or pronoun is the vP, a strong binding domain. The new binding conditions in (3) require the pronoun to be free and the anaphor to be bound in that domain. Since the pronoun is not free given the coindexation in (4) a violation of condition B ensues as in the standard theory. The present theory therefore can account for the cases in which anaphors and pronouns are in complementary distributions as in (4) as well as those cases in which complementarity breaks down as in (1)-(2).

Bound Anaphora, Binding, Incremental Interpretation and the Role of the I/C Interface

Réjean Canac-Marquis

This paper proposes to explore the role of the C/I interface in accounting for a number of fundamental properties of Bound anaphora, in particular Weak and Weakest Cross effects. As time permits, the discussion will include some consequences for Binding domains and Reconstruction effects. The analysis exploits recent developments in the theory of phases (Chomsky 2000, 2001) in the Minimalist framework (Chomsky 1995, 2000). I propose that core properties of bound pronoun configurations, binding domains and reconstruction effects may be the result of Incremental Interpretation at the I/C interface. More precisely, adapting the Minimal Asymmetry Hypothesis and the Fragment Interpretation of DiSciullo (2003), the C/I Interface is forcing Incremental Interpretations that in turn, have a direct impact in defining core properties of Bound anaphora and Binding Theory.

The issue of Bound Anaphora in the generative grammar tradition has been closely linked to the phenomena of Weak Cross Over [WCO: Higginbotham's (1980), Reinhart's (1983), Koopman & Sportiche's (1983), Safir(1984, 1996) Williams 1992)] and Weakest Cross Over [WeakestCO: Lasnik and Stowell (L&S 1991), Postal (1993), Safir (1996)]. WCO (1a,b) and WeakestCO (2, 3a-c) are structurally similar opertor/bound variable pronoun configurations, however only the latter allows a bound variable reading. The account in terms of "true" vs. "pseudo" operator of L&S is not only weak on a semantic basis, but is empirically wrong as shown in Postal (1993) (4), Ruys (2004). Canac Marquis (1996) pointed out further contexts where the distinction fails, such as in restrictive relative clauses in French, (5, cf. 1b)) and a puzzling contrast involving long-distance scrambling of Wh-operators in scrambling languages such as Japanese (6) and Hindi (7). After reviewing the main data, I develop my analysis based the following descriptive generalization, initially proposed in Canac-Marquis (1996):

Bound Anaphora Licensing (BAL)*: If A binds B at level Ln, then A binds B at all Ln-1 where A and B co-occur.*
Developed in a pre-Minimalist model and abstracting away from A-movement, the generalization states that no new bound anaphora may from A-bar movement. While the D vs. S-structure distinction on which BAL is stated is eliminated in the Minimalist approach, I propose it can be advantageously (i.e. by now including A-movement) reinterpreted as resulting from an incremental approach to sentence interpretation at the C/I Interface. According to recent proposals, derivation operates in phases (Chomsky 2000, 2001) or multiple spell outs (Uriageraka 2003) or fragments (DiSciullo 2003), ie. in chunks which once processed create opaque grammatical domains. Once a fragment is spelled out or interpreted, it cannot be further accessed by the computational system, though it presumably can at the C/I interface. While the precise factors determining phases and fragments are under investigation, they are related to cyclic domains (sentence), Asymmetry domains (DiSciullo 2003) and I maintain in this paper, feature checking domains (A-chains and A-bar chains), which can be viewed as sub-cases of Asymmetry domains. Under this view, not only A-bar bound anaphora, but also Binding domains are determined by incremental or fragmental interpretation at the C/I interface. For instance, the determination of local domains for binding theories (ie. A-binding) basically corresponds to the domain of A-chains. A-chains can in turn be reduced to Fragment interpretation the Minimal Asymmetry (DiSciullo 2003) if we assume that case feature checking actually closes a fragment for interpretation (Phase Impenetrability Condition, Chomsky 2001), in particular DPs (Adger 2003) and I maintain here AgrPs. Hence the absence of WCO effects with so called A-movement is reduced to the fact that A-chains only create a fragment once the head of the chain is checked for its case feature, ie. Crucially *after* movement. However, derivations being bottom up, any WCO configuration created by A-bar chains will be post A-chain and will force to modify the initial bound/unbound interpretation *between* anaphoric elements inside fragments (assuming copy theory), which I interpret as a WCO effect, ie. bound anaphora cannot be re-interpreted within elements of a closed fragment. As for WeakestCO configurations, I argue that the so-called distinction between "pseudo" and "true" operators is not intrinsic, but configurational: "true" operator configurations actually result from A-bar chains created by feature checking. The distinction is therefore predicted to be subject to language variation. This is borne out: Wh-movement but not Null operators or Topicalization, trigger WCO in languages like English. In contrast, Wh-movement not triggered

by feature checking, e.g. scrambling in Japanese, does not show WCO. Yet again in Hindi, a WCO effect surfaces with scrambling in the presence of a Wh-scope marker indicative of feature checking. If time permits, I will discuss how anti-reconstruction effects in both A-chains and A-bar chains can also be traced back to the incremental interpretation of fragments at the C/I interface.

1a. ?* Whoi does hisi sister call ti a moron, ... b. ?* Every mani that hisi mother loves ti
2. Franki, I am sure hisi sister called ti a moron.
3a. Franki was easy [Oi for hisi brother to outshine ei] b.This booki was too obscene [Oi to have itsi author publicize ei] c.. Which mani did you look at ei [Oi before hisi wife had spoken to ei]
4. * Harryi, I am quite sure [a picture of himi] fell on ei
5. Chaque enfanti que sesi parents ont aidé ti a réussi. (Sportiche 1982)
6.* kis-ko uskiii bahin-ne socaa [ki raam-ne ti dekhaa thaa (Mahajan 1990) who(DO) his sister(sub) thought that Ram(SUB) seen be-past (Whoi, hisi sister thought that Ram had seen ti)
7. Darei-o [[soitui-no hahaoya]-ga [$_{CP}$[Hanako-ga ti aisiteiru] to] omotteru] no (Saito, 1992)
who-acc the guy-gen mother-nom nom love COMP think (Whoi, hisi mother thinks that Hanako loves ti)

Why interpreting weak pronouns in natural language is not ambiguous

Stanca Somesfalean

This paper provides evidence to the fact that the interpretation of weak pronouns in natural language is never ambiguous, given the specific asymmetrical configurations these elements are part of. Moreover, a parser that is able to recover and recognise these basic relations, i.e. the Asymmetry-based parser (Di Sciullo, 2000-2004), once integrated in a web-search tool, will be able to avoid potential ambiguity problems that may arise from the automated interpretation of weak pronominals. As a consequence, the precision and recall of web-oriented tools can be significantly improved.
It has been shown (Kayne 1975, Cardinaletti and Starke 1999, Sportiche 1999) that weak pronouns (i.e. clitics) possess syntactic and semantic properties that differentiate them from strong pronouns, such as the obligation of having a particular type of antecedent in the discourse, the impossibility of occupying the theta-position (or base-position), or the impossibility of being coordinated. These are elements that require either a specific interpretation within the discourse, but not the immediate context (in the case of pronouns), or an interpretation referring to an immediate antecedent (in the case of possessives or anaphors).
Interpreting such elements in an automated web-search tool has proven to be often problematic, mainly because they give rise to ambiguity. Constructions such as (1) and (2) show two typical examples of ambiguity caused by weak pronominal elements: they involve the English possessive «'s» and the French object pronominal clitic, which is homonymous with the definite determiner:

(1) a. [my friend**'s** child] pictures
b. the pictures representing my friend's child
c. [my friend's child]**'s** pictures
d. the pictures of the child of my friend

(2) apprendre les langues du monde et les analyser

We show that, given configurational differences between the elements involved in these constructions, they cannot be subject to ambiguity : in a linguistic theory whose primitives are the structural and semantic relations established between pairs of constituents, such as the Asymmetry Theory (Di Sciullo, 2000-2004), there is always an asymmetrical relation of dominance and of asymmetric c-command between the argumental clitic and the projection hosting the verb, as well as one between the D projection and the possessive clitic. Thus, clitics are no longer subject to erroneous interpretation (i.e. ambiguity), once the

parser integrates the asymmetrical relations and the feature properties specific to these elements

Asymmetry of Feature Assignment and its Consequences

Olga Zavitnovich-Beaulac

The idea defended in this paper is that optimal interpretation of a derivation at the interfaces is conditioned by the requirement that all relations of linguistic objects must be in asymmetrical configuration, as proposed in Di Sciullo (1998, 2003, 2004). The work of this hypothesis is shown in application to the case of multiple wh-questions. Namely, we show that asymmetric configuration of Q and Focus features is crucial at the interfaces and, in fact, this configuration determines the semantics of a multiple wh-questions. We argue the asymmetry of these features determines presence vs. absence of the Superiority effects, as well as an availability of pair-list vs. single-pair reading in multiple wh-questions. This hypothesis is mainly considered in application to Russian data, although data from other languages in support of the argument are discussed in the paper as well.

In multiple wh-questions Russian obligatory fronts all wh-phrases. The language allows alternation in the order of wh-phrases both in matrix sentences (cf.(1)), as well as in long-distance extraction cases thus demonstrating what appears to be full immunity to the Superiority constraints in any context:

(1) a) Kto kuda khodil?
who where went
"Who went where?"
b) Kuda kto khodil?

Based on this observation Bošković (1998) concludes that in Russian the Q-feature is always weak hence checked covertly via LF movement; and wh-phrases move to check the Focus feature from which follows the immunity of wh-phrases to the Superiority Constraint.

We argue that the apparent "lack" of Superiority effects is a result of interaction of several factors including semantics and discourse, which in turn is a result of asymmetric feature-configuration. Accordingly, *prima facie* violation and immunity to the Superiority condition may in fact be the necessary operation of narrow syntax required for an appropriate interpretation of a derivation at the level of semantics.

Indeed the contexts within which (1a) and (1b) can be asked differ. (1a) is neutral: an inquirer requests new information regarding who went where. Variant (1b) is acceptable in situations where either an additional clarification is required, or as echo questions. Both questions require pair-list interpretation. In terms of feature assignment that means that in multiple wh-questions the two wh-phrases carry different features. Specifically, we argue that in (1) the first wh-phrase raises to Spec, CP to check the [+Q] feature, while the second wh-expression moves to Spec, FocP to check the [+Foc] feature. Which of wh-phrases gets the Q feature, hence raises first, is determined by the discourse factors, i.e. which semantics the question is intended to convey.

Yet the asymmetry of Q and Focus features can be reversed, when the Focus feature appears higher than Q feature, the questions gets the semantics of a single-pair answer as the following Japanese example illustrates (from Hagstrom 1998):

(2) a) dare-ga kinoo nani-o katta no?
who-Nom yesterday what-Acc bought Q
"Who bought what yesterday?"
b) nani-o kinoo dare-ga katta no?

Only single-pair interpretation is available for a sentence in (2b) where wh-object moved over wh-subject. We argue that this movement is triggered by a Focus feature and the resulted feature asymmetry determines the single-list interpretation.

The broader implication of the claim is that the requirement of obtaining asymmetrical configurations determines the outcome at the PF interface, placing the constituent with certain feature specification in distinct functional projections.

Type-shifting verbs and semantic (de)composition

Roberto G. de Almeida

Research in lexical semantics has suggested that verbs such as *begin* and *enjoy* semantically select for a complement that denotes an activity or an event, which are specified in the form of a progressive or an infinitival (e.g., *The secretary began typing/to type the memo*). Pustejovsky (1995, 1998) and Jackendoff (1997), for instance, have proposed that the lack of specification of the activity or event (as in *The secretary began the memo*) leads the main verb to "coerce" the complement NP to change its type to conform to the semantic restrictions of the verb. This process is taken to rely on semantic properties of the noun complement, such as its "telic role" (its "purpose and function"), which specify the "typical" properties of the noun referent that are encoded semantically. Thus, since memos are typically written/typed (and read) but not often eaten, the interpretation of type-shifting constructions implies recovering information from the *lexical* entry (say, *memo*) such that *The secretary began the memo* is semantically interpreted as *The secretary began typing/writing the memo.*

Recent experimental studies (e.g., McElree, Traxler, Pickering, Seely, & Jackendoff, 2001; Traxler, McElree, & Pickering, 2002) have provided support for the coercion process during sentence comprehension. These studies found increased reading times in post-verbal positions of sentences containing type shifting verbs (as opposed to activity verbs such as *read*), suggesting that, for these constructions, the coercion process is computed on-line during semantic interpretation. These data—and their theoretical underpinnings, as espoused by Pustejovsky, 1995, and Jackendoff, 1997—are taken as evidence for two types of theses that have permeated the semantics literature in the last decades: (1) that lexical items are semantically represented as feature sets or semantic templates, and (2) that semantic representation of sentences does not follow what Jackendoff (1997) called "simple" (i.e., Fregean) compositionality principles.

In this paper, I will discuss these theses and present data that challenge the results obtained by McElree et al. and Traxler et al. In particular, I will present data from two sentence reading experiments (de Almeida, in press) which show that type-shifting effects (taken to be longer reading times engendered by the computation of the coercion process at post-verbal sentence positions) are not obtained with sentences in isolation nor with sentences embedded in contexts that specify the nature of the activity performed over the complement NP.

I will contrasts different perspectives on the nature of the semantic interpretation of constructions of the type *begin NP* or *enjoy NP.* In particular, I will focus on Jackendoff's and Pustejovsky's views. In essence, Jackendoff assumes that that the coercion process has two main steps, first with the computation of a principle such as "Interpret NP as $[_{\text{Activity}}$ F(NP)]", in which F is a function expressed by the main verb (the shifting of NP from an entity into an activity. The second step is the selection of the telic role (a la Pustejovsky 1995), which gives rise to the semantic "co-composition" of the sentence—that is, an "enriched" (rather than "simple") form of compositionality. I will argue that these expressions, in the absence of a gerundial or infinitival complement, trigger the computation of pragmatic (conceptual) inferences, not intra-lexical semantic information. Processing such underspecified constructions in isolation is seen as a process of unleashing the search for conceptual fillers, which specify the activity that the verb refers to. Contextual information—from both discourse representation as well as, locally, from the meaning of the subject NP—constrain the computation of those inferences. As Fodor and Lepore (1998) suggest, what is underspecified about constructions such as *begin NP* or *enjoy NP* is that they violate Gricean-type conversational maxims.

Rodolfo Delmonte

Parsers today are required to produce a semantically interpretable output for any text: in order to achieve such a goal, Grammatical Relations need to be assigned to words usually in some kind of hierarchical representation, before some Logical Form can be built. We also assume that in order for a parser to achieve psychological reality it should satisfy three different types of requirements: psycholinguistic plausibility, computational efficiency in implementation, coverage of grammatical principles and constraints. Principles underlying the parser architecture should not conform exclusively to one or the other area, disregarding issues which might explain the behaviour of the human processor. In accordance with this criterion, we assume that the implementation should closely mimick phenomena such as Garden Path effects, or an increase in computational time in presence of semantically vs syntactically biased ambiguous structures. We also assume that a failure should ensue from strong Garden Path effects and that this should be justified at a psycholinguistic interpretation level.Since we base most of our grammatical principles on LFG we assume that lexical information is the most important knowledge source in the processing of natural language. However, we also assume that all semantic information should be made to bear on the processing and this is only partially coincident with lexical information as stored in lexical forms. In particular, subcategorization, semantic roles and all other semantic compatibility evaluative mechanisms should be active while parsing each word of the input string. In addition, the Discourse Model and External Knowledge of the World should be tapped when needed to disambiguate ambiguous antecedents.Constituency-based parsing models are lately starting to be supplanted by word-level parsing models in the vein of Dependency-Based parsing and Minimalist-Based Parsing. However, a parser also needs to embody some psycholinguistically viable and computationally efficient model. In that perspective, we believe that a sound parsing strategy should opt for a parser that strives for an even highersemantically closer level, arguments and adjuncts, where top-down or perhaps mixed/hybrid strategies are activated by the use of a strongly language-dependent lookahead mechanism.We would like to speak in favour of such an approach in which locality is sacrificed for a mixed or hybrid model, partially bottom-up, which uses both grammatical function driven information and lexical information from subcategorization frames to direct the choices of the argument vs adjunct building parsing process.In a word level parser, uncertainty will have to be overcome at constituency boundary and at clause boundary in order to choose between argument and adjunct. A parser that looks for constituents has to cope only with the clause boundary uncertainty level and then decide which constituent can be interpreted as argument or else be left for adjunct interpretation. However, for how easy this choice may seem, English has a peculiarity which doesn't allow a parser writer to be too self-confident: it allows compless clauses to be processed freely, both as complements and as adjuncts. This option, which is rather common in real texts, may cause the parser to treat a NP as the OBJect of a higher matrix clause, rather than as SUBJect of a lower complement clause thus causing garden-path phenomena - at psycholinguistic level - and just a freezing of the parser at a computational level. Of course word-level parsers don't suffer from this problem: they however suffer from long-distance dependancy problems, structural discontinuities, as well as other language-specific aspects.We will present our mildly bottom-up parser for arguments and adjuncts by discussing a number of language-specific issues, as the one raised by compless complement clauses. This will be done by comparing our parser with a number of online dependency-based parsers.

Anna Maria Di Sciullo and Philippe Gabrini

Nowadays, Internet browsers offer limited operations mostly based on logical connectors, be they implicit or explicit. Most of them accept any text and give the impression that they process natural language text, but this is only an appearance as most of them drop short words as noise and come up, as a result of this, with far too many irrelevant results.

Query languages have been in existence for a long time, originally and usually for database operations but not limited to them anymore. They offer a simple and very rigid syntax that is certainly easy to parse, but difficult for non programming users to grasp. They all offer a limited predefined set of operations. Examples of such languages show that the learning curve is steep for an average user whatever claim they may make.

Programming languages are certainly much more sophisticated than query languages. Although more complex, they offer a relatively simple syntax. The degree of specialization of these numerous languages (several hundreds) makes it so that most Internet users will never be able to use them in a satisfactory manner. Of course, that sophistication makes it possible to define precisely the processing and retrieval desired. Parsing these "mechanical" languages is by now a well understood process; ambiguities have been removed from the language definitions even though some programming languages are not context free, and there exist well known techniques making it possible to translate programs into machine language, the built in language of the computers.

Natural language processing is much more complex than programming language processing. We know that in all languages ambiguities do exist, although the average human brain has no problem resolving these. Since query languages and programming languages are beyond the grasp of the average user, and not well suited for general queries, natural languages are the only interfaces that should be used with Internet tools, if excellent results are to be obtained. In order to do that, we have started to design new linguistic techniques and heuristics.

There is obviously a very wide gap between what is now available and what could be done through natural language parsing. The Asymmetry approach to parsing offers a systematic way of parsing natural language queries and has already given promising results. This paper explores the advances already made and being developed in the field of information retrieval using that approach.

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TV is Dead – Long Live the WEB (SSGRR-2000)

Harold Kroto, Nobel Leaurate, University of Sussex, UK

Science, Engineering and Technology are as vital to our intellectual and cultural development (particularly our children's) as they are to our training to get along in the Modern World. Some efforts to redress the problems involved in the general Public awareness and understanding of science and engineering (PAUSE) issues are being initiated via the Vega Science Trust (www.vega.org.uk), which aims to take advantage of the revolution in TV and Internet communications technology to improve matters. The best scientists and science communicators are being recorded and the programmes are being broadcast on BBC-TV and the Internet. Furthermore School/University outreach programmes are being developed and Vega is piloting ways in which members of the Science, Engineering and Technology (SET) community can, as individuals and groups, make important contributions. Excerpts from SET programmes will be presented. These efforts present a perspective on SET which places the cultural factors in the foreground and focuses on the intrinsic charisma of science which is hidden from many. It is now cruical that the society in general and the scientific community in particular accept that serious problems are involved in communicating science and the Internet is set to play a major role. Before the invention of the printing press there was only one book in the west – the bible – and it was hand-written by monks. After the invention the printing press book – writing and reading was democratized and this was truly the beginning of general education. In a similar way the birth of the Internet has democratized broadcasting – the broadcasting channels no longer control the dissemination of recorded material – individuals and groups of individuals can now do it themselves and so the Internet has enabled broadcasting to fulfill the promise it has always had – to be a superb educational medium.

Electronic Business and Education (SSGRR-2001)

Bob Richardson, Nobel Laureate, Cornell University, USA

There is no longer any question that the Internet and electronic communication are the major new tools for collaborative advances in the creation of new knowledge and in future learning. There are countless examples of highly successful professional courses taught on the Internet. Similarly, international and multidisciplinary collaborations in scientific research based upon little contact other than through electronic communication dominate the scientific literature. Perhaps the most profound examples of distance collaboration in science are found in astronomy. The Hubble telescope has permitted astronomers to gather breathtaking images from the most remote observatory imaginable – one in orbit around the earth. A significant challenge remains. The challenge is to devise a remote mode for nonverbal communication about difficult concepts. In the shared creation of new ideas and knowledge, facial expressions and body gestures frequently play an important role in peer interactions. As the speed and bandwidth of electronic communication increase, we have the prospect that the important elements of human contact can be imitated. Without the development of sympathetic peer or mentor relationships, distance learning will remain quite sterile.

E-Business and E-Challenges (SSGRR-2002)

Jerome Friedman, Nobel Laureate, MIT, USA

The development of Homo sapiens has been a history of innovations, from the earliest crude tools to the modern technological society of today. The growth of science and technology has been exponential during the last century; and under the right circumstances, this rapid growth can be expected to continue. The major innovations of the future - those that will shape the society of the future - will require a strong foundation of both basic and applied research. It is ironic that quantum mechanics, one of most abstruse conceptual frameworks in physics - one that was developed to explain atomic spectra and the structure of the atom, lies at the foundation of some of our most important technological developments, because it provided the understanding of semiconductors that was essential for the invention of the transistor. Quantum mechanics thus contributed directly to the development of technologies that gave us world wide communication, computers with their applications to all phases of modern life, lasers with many diverse uses, consumer electronics, atomic clocks, and superconductors - just to mention a few. The internet and the World Wide Web, which are profoundly reshaping the way that we communicate, learn, and engage in commerce, owe their origins in a deep sense to the physicists of the past who worked to understand the atom. In modern industrial nations, quantum mechanics probably lies at the basis of a sizable fraction of the gross national product. This is but one example, and there are many others in all areas of science that demonstrate this point. It is clear that innovation is the key to the future and the human drive to understand nature is the key to future innovation. Society must do all that it can to preserve, nurture and encourage curiosity and the drive to understand.

The Next Generation of IP – Flow Routing (SSGRR-2003)

Lawrence G. Roberts, Father of the Internet, USA

For the last 33 years IP routers have not changed, they still support only "best effort" traffic. However, the bandwidth available to people has been increasing rapidly with the advent of broadband access. The result is that many new services are now desired that require far better QoS than "best effort" IP can support. Also, with broadband, the problem of controlling the total usage and carrier expense has become important. Thus, it has become critical to improve both the delay performance and the control of bandwidth for IP service, much as was accomplished in ATM. Also, call rejection for high bandwidth streaming services like video is required instead of random discards if quality is to be maintained. All these problems can be solved with no change to TCP/IP by routing flows rather than packets. This requires keeping some state information for the duration of the flow, but this information can be captured on the fly as the first packet goes by. This permits an IP flow router to achieve all the capabilities of an ATM switch, but without the call setup delay and at a lower cost than a conventional IP router.