The University of Georgia

AI Newsletter

Institute for Artificial Intelligence
The University of Georgia
Athens, GA 30602-7415 U.S.A.

Spring 2012

Research Spotlight: **Finding Deceptive Language**

Are you telling the truth? Soon, Shayi Zhang's alert computer may know. As a master's thesis project, she is creating easy-to-use software to implement several well-known tests for deceptiveness in language.

One set of tests is from Texas psychologist James Pennebaker; the other set was collected and refined by then-UGA graduate student Cati Brown, who earned her doctorate by studying a collection of tobacco industry documents that were known to reflect deceptive practices.

All the tests revolve around choice of words. For example, people who are speaking or writing deceptively are less likely to express clear logical relationships between ideas; they want to leave it to you to draw the conclusions. They may also avoid referring to themselves or other people with pronouns.

News: **4 AI Faculty Win Awards**

Four IAI Faculty Fellows have won significant awards this spring. **Khaled Rasheed**, our graduate coordinator, won the 2012 Excellence in Teaching award from the Computer Science Department. **Pete Bettinger** is the Xi Sigma Pi Professor of the Year for 2012 in the School of Forestry and Natural Resources. **Adam Goodie** won the University's Creative Research Medal for his work on cognitive and personality determinants of gambling pathology. And last but certainly not least, **Bill Kretzschmar** won the University's 2012 Albert Christ-Janer Creative Research Award for his work on complexity theory as applied to language change. Congratulations to all!

News: **A Flurry of Industry Visits**

Seven industry visitors honored us with their presence at an informal Monday afternoon research seminar series. They included Norm Geddes of Applied Systems Intelligence, Art Recesso of Evirx, Mike Jarus of Knowlagent, Salima Ali and Jim Flannery of Four Athens Technology Incubator, Brent Chandler of FormFree, and Pete Dugas of TSAV. Such visits are an excellent way for potential employers and collaborators to make contact with us and our students. We plan have a seminar suitable for visits every semester; e-mail Michael Covington (mc@uga.edu) to schedule a visit.

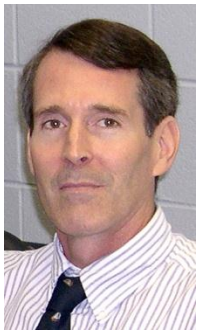
Research Spotlight: **A Computer That Can Change Its Mind**

When we learn about something from a description, we make reasonable assumptions, then change them if we find out that the details are not what we expected. That's a key idea in the IAI's ARC Project (Architecture Represented Computationally), which aims to make a computer understand verbal descriptions of Gothic cathedrals.

ARC relies on defeasible logic – the logic of how to change your mind. Pioneered by IAI founder Donald Nute in the 1980s, defeasible logic classifies facts and rules as "defeasible" (tentative) or "indefeasible." When an indefeasible fact conflicts with a defeasible one, the indefeasible one wins. When two defeasible facts conflict, probably neither one is true.

Tyler Carlson's just-completed master's thesis applies defeasible logic to cathedrals, complete with an implementation written in Prolog. For a copy of the thesis and more information about the project, contact the IAI.

Letter from the Director



Welcome to the spring newsletter! As always, we hope you enjoy receiving the IAI Newsletter and keeping up to date on all the cool activities we have going on. Feel free to send us your comments and suggestions about the newsletter; we are always glad to hear from you. Daniel Tuohy, MSAI'06, dropped by the office several weeks ago; it was great to see him and catch up on his current activities.

As reported in the Fall 2011 newsletter, both the AB in Cognitive Science and the MS in Artificial Intelligence continue to flourish. The undergraduate Cognitive Science program continues to grow and we now have nearly 85 majors. (Where are they all, and why don't they ever come to the Institute luncheons?) Double majoring in Cognitive Science and something else continues to be very popular. Paul Prae stands out as one of those special (and gifted) students in cognitive science having computer science as his second major. Plus, he collected a couple of certificate program achievements to top off his undergraduate career before heading out to work for Microsoft beginning almost immediately. In the MSAI program, three students will graduate this spring (Jared Smythe, Michael Walliser, and Tyler Carlson; graduates 162, 163, and 164, respectively), while two others finished up all their requirements (Karthik Nadig and Siva Venkadesh) but are postponing graduation until the summer semester. A few other students are very close to finishing and are looking to graduate this summer as well. Karthik will be leaving for China soon to present one of our papers related to MRI birdcage coil design. Jared, Tyler, Swetha Pandhiti (December, 2011 graduate), and Ganesh Bonde will be traveling to Las Vegas in mid-summer to present papers related to their thesis projects.

The timely scheduling of AI courses, especially those cross-listed with computer science continues to be problematic. We have the go-ahead from the Dean's office to arrange an advanced class this fall but our request for two permanent lecturer positions was denied. The new Dean for Arts and Sciences arrives this July and hopefully he will address these concerns.

On another note, we'd like to get your feedback on a couple of items currently being discussed:

- What are your thoughts on renewing our campaign for a PhD program in AI?
- What are your thoughts on establishing a Center for Robotics Research within the Institute?

Let us hear from you about these items (or about anything else), and free to drop in any time.

Don Potter
Director, IAI

Recent Theses

Jared Smythe, *Roulette Wheel Particle Swarm Optimization*

Michael Walliser, *Fort Stewart Shortest Path Analysis of Debris Cleanup Options*

Tyler Carlson, *Non-Monotonic Knowledge Representation and Reasoning for Natural Description of Gothic Cathedrals*

For a copy of any thesis, e-mail shbrooks@uga.edu.

Selected Publications and Presentations

T. Carlson, S. Van Liefferinge, E. Holt, R. A. Smith, M. A. Covington, and W. D. Potter, "Application of Defeasible Domain-Specific Knowledge to the Description of Gothic Cathedrals in the ARC Project," 2012 International Conference on Artificial Intelligence (ICAI'12), Las Vegas, July, 2012.

Michael A. Covington, "Medical Artificial Intelligence at the University of Georgia," invited presentation, Association of Health Care Journalists, Atlanta, April 2012.

Michael A. Covington, Anya Lunden, Sarah Cristofaro, Stephanie Johnson, Claire Ramsay, Beth Broussard, Shayi Zhang, C. Thomas Bailey, Robert Fogarty, and Michael T. Compton, "Phonetic Measurement of Reduced Facial Muscle Movement among Young Adults with First-Episode Schizophrenia-Spectrum disorders," Georgetown University Round Table on Languages and Linguistics, Washington, D.C., March 2012.

P. Doshi, X. Qu, A. S. Goodie, and D. Young, "Modeling Human Recursive Reasoning Using Empirically Informed Interactive POMDPs," *IEEE Transactions on Systems, Man and Cybernetics (SMC),* Part A, in press.

Charles Hollingsworth, "Using Dependency-Based Annotations for Authorship Attribution," 15th International Conference on Text, Speech, and Dialogue (TSD 2012), Brno, Czech Republic.

William A. Kretzschmar, Jr., "Complex Systems and Sociolinguistics," invited presentation, Cambridge University, March 2012.

Frederick Maier, "Interdefinability of Defeasible Logic and Logic Programming under the Well-Founded Semantics," *Theory and Practice of Logic Programming,* in press.

K. Nadig, W. M. Potter, and W. D. Potter, "Homogeneous RF Coil Design Using A GA," 25th International Conference on Industrial, Engineering & Other Applications of Applied Intelligent Systems, (IEA/AIE-2012), Dalian, Liaoning, China, June, 2012.

Swetha Pandhiti and W. D. Potter, "Blackboard Architecture of Unmanned Aerial Vehicles using Fuzzy Inference Systems," 2012 International Conference on Artificial Intelligence (ICAI '12), Las Vegas, July, 2012.

Roberto Perdisci, Igino Corona, and Giorgio Giacinto, "Early Detection of Malicious Flux Networks via Large-Scale Passive DNS Traffic Analysis," *IEEE Transactions on Dependable and Secure Computing,* in press.

Stephen M. Shellman, Michael A. Covington, and Marcia Zangrilli, "State of the Practice and Art in Sentiment Analysis," 4th International Conference on Applied Human Factors and Ergonomics (AHFE 2012), San Francisco.

J. Smythe, W. D. Potter, and P. Bettinger, "Application of a New Multi-Valued Particle Swarm Optimization to Forest Harvest Schedule Optimization," *2012 International Conference on Genetic and Evolutionary Methods* (GEM'12), Las Vegas, July, 2012.

S. Van Liefferinge, T. Carlson, E. Holt, R. A. Smith, M. A. Covington, and W. D. Potter, "The ARC project: Reasoning about Representations of Gothic Cathedrals with Artificial Intelligence," 16th International Conference on Information Visualization (ICIV'12), Montepellier, France, July, 2012.

Yifeng Zeng and Prashant Doshi, "Exploiting Model Equivalences for Solving Interactive Dynamic Influence Diagrams," *Journal of Artificial Intelligence Research (JAIR)* 43:211-255, 2012.

How to Sponsor Research

As an industrial partner or associate of the IAI, you can be involved in our research four ways:

Collaboration, especially student projects. It doesn't necessarily cost anything to work with us. We are always looking for good research topics, especially for master's theses.

Sponsored research. You can contract with us through the University of Georgia Research Foundation (UGARF) to do research for your company. *We are always looking for research sponsors.*

Donations. If you don't need confidentiality or a specific deliverable, you can simply make a gift to the IAI designated to support a particular research program. Donations are made through the Arch Foundation and are fully tax-deductible; contact us to make arrangements, or click on the "Support" button on www.ai.uga.edu.

Consulting. You can hire faculty members or advanced graduate students to work for you part-time as independent contractors. The University encourages this, within reasonable limits. It's a good way to do a small project with a high level of confidentiality, but the consultant works privately, and you don't get access to University facilities. Consulting projects often grow into sponsored research.

We also invite all industrial partners and associates to **come and visit us** and speak with groups of students. This is your "inside track" to recruiting.

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The AI Newsletter is published twice a year. For more information about the Institute's activities, e-mail shbrooks@uga.edu or look at www.ai.uga.edu. Thanks for your interest!