How does one estimate the price of a “Stride Rite Naiya Sandal Toddler Girls Size 7W” or a “Pivot Mach 429 Carbon Mountain Bike Frameset, Size Medium”? As a data science manager at eBay Inc., Giri Kumanar (Ph.D. ’08, advised by Prof. James Allan) led a team that worked on the difficult problem of estimating the final selling price of the millions of diverse items listed for sale on eBay. “Sellers on eBay typically have a hard time determining how much their items are worth,” said Kumaran. “They also struggle with how best to set their prices to optimize for sales, profit, sales velocity, seasonal trends, and so on.” The real-time price guidance service that Kumaran’s team built proved to be a hit with sellers. It led to more successful sales at better prices than before, thus impacting seller happiness and eBay’s bottom line.

The real-time price guidance service is powered by a sophisticated machine learning model that utilizes hundreds of features. “Surprisingly, its roots are in very basic information retrieval,” noted Kumaran. “The most impactful feature is what similar items sold for recently. These items are found by searching through past sales with the item’s title as a query using BM25 as a ranking function!” Working on this problem, first as an individual contributor and later as a team lead, Kumaran found further validation that the key to a successful supervised model lay with the careful design and choice of features rather than the particular algorithm itself. Also playing a critical role in shaping the price guidance service was Kumaran’s product management counterpart and fellow UMass Amherst CICS alum, Vikas Khandelwal (M.S. ’01, also from the Center for Intelligent Information Retrieval (CIIR) and advised by Allan).

Prior to working on the pricing problem, Kumaran developed bidding algorithms for eBay paid search marketing campaigns. The development of a few features that captured the actual return on investment on bids placed on keywords dramatically changed the campaigns from loss to profit-making for eBay.

Today, Kumaran works as a senior director of data science and business intelligence at Expedia Inc., where he leads efforts to combat fraud and manage risk in online transactions. He believes that to be successful in a career in data science, it is important to get exposure to a wide variety of tasks. The ones who can consistently demonstrate they can do this are the top data scientists, the ones who can consistently demonstrate the third skill are the most sought after.

At a high level, a data scientist should have expertise in machine learning, empirical methods, etc., and, an ability to glean insights from data, and leverage those insights to make impact. According to Kumaran, these three skills are critical for a successful career in data science and are progressively difficult to acquire. Even amongst experienced data scientists, the ones who can consistently demonstrate the third skill are the most sought after. “These are exciting times in the data science field, and it’s a thrilling experience being in the frontlines,” said Kumaran. “Barriers to entry are being broken, with several startups and big companies offering data science platforms as a service. New applications of data science in fields like healthcare, government, and geographical exploration are emerging. Continual breakthroughs are being made in data engineering and machine learning. All this is great news for the still-maturing field.”

Save the Date: April 29, 2016

Recipients of the 8th Annual Outstanding Achievement and Advocacy Awards (OAA) will be honored on Friday, April 29, 2016. The awards recognize the remarkable accomplishments of graduates of the college’s degree programs and acknowledge the support of important friends of the college. For details, go to: cics.umass.edu/outreach/oa2016.
Congratulations to the following Ph.D. graduates who have received tenure-track assistant professor appointments: Thomas Helmuth (Ph.D. ’15), Department of Computer Science, Washington and Lee University; George Konidaris (Ph.D. ’11), Departments of Computer Science and Electrical and Computer Engineering at Duke University; Scott Kuindersma (Ph.D. ’12), School of Engineering and Applied Science, Harvard University; and Scott Niekum (Ph.D. ’13), Department of Computer Science, University of Texas, Austin.

Ben Carterette (Ph.D. ’08), associate professor of computer and information sciences at the University of Delaware, received the Best Paper Award at the 2015 ACM SIGIR International Conference on the Theory of Information Retrieval (ICTIR 2015) held in Northampton, MA in September.

Henning Schulzrinne, (Ph.D. ’92), the Julian Clarence Levi Professor of Mathematical Methods and Computer Science at the Fu Foundation School of Engineering at Columbia University, has been named the recipient of the 2016 IEEE Internet Award for exceptional contributions to the advancement of Internet technology.

Recent graduate Ranysha Ware (M.S. ’15), of the Architecture and Language Implementation (ALI) Lab, has taken a position at the MIT Lincoln Laboratory, working on an IARPA program in cybersecurity.

Tuomas Sandholm (M.S. ’94, Ph.D. ’96), computer science professor and director of the Electronic Marketplaces Laboratory at Carnegie Mellon University (CMU), was quoted in a Pittsburgh Post-Gazette article, describing his work on Claudico, a CMU-developed program that plays (and beats) human professional poker players.
Recent Computer Science Ph.D. Graduates (February 2015 and May 2015)

Md. Ashraf-ful Alam; Reconstructing Geometric Structures from Combinatorial and Metric Information; Ileana Streinu, Advisor; Feb. 2015; Software Engineer, Intel Corporation

Gordon Anderson; An Analysis of Two Student Learning Strategies in High Enrollment College-based Computer-based Courses; Robert Moll, Advisor; May 2015; Lecturer, College of Information and Computer Sciences, UMass Amherst

Boulat Bash; Fundamental Limits of Covert Communication; Donald Towsley, Advisor; Feb. 2015; Postdoctoral Fellow, BBN Technologies

Bruno Castro da Silva; Learning Parameterized Skills; Andrew G. Barto, Advisor; Feb. 2015

Yung-Chih Chen; Robust Mobile Data Transport: Modeling, Measurements, and Implementation; Donald Towsley, Advisor; May 2015; Senior Performance Engineer, Akamai Technologies

Stefan Christov; Model-Based Guidance for Human-Intensive Processes; Lori A. Clarke, George Avrunin, Advisors; Feb. 2015; Assistant Professor of Software Engineering, Quinipiack University

Boduo Li; A Platform for Scalable Low-Latency Analytics using MapReduce; Yanlei Diao, Advisor; May 2015; Researcher, NEC Laboratories America

Jason Naradowsky; Learning with Joint Inference and Latent Linguistic Structure in Graphical Models; David A. Smith, Advisor; Feb. 2015; Research Associate, Machine Reading Lab, University College London

Laura Sevilla Lara; Long Range Motion Estimation and Applications; Erik Learned-Miller, Advisor; Feb. 2015; Postdoctoral Researcher, Max-Planck Institute, Germany

Borislava Simidchieva; Variation in Human-Intensive Systems: A Conceptual Framework for Characterizing, Modeling, and Analyzing Families of Systems; Leon Osterweil, Advisor; May 2015; Scientist, Distributed Systems Group, BBN Technologies

Michael Wick; Epistemological Databases for Probabilistic Knowledge Base Construction; Andrew McCallum, Advisor; Feb. 2015; Senior Member of Technical Staff, Oracle Labs East

Dan Xie; An Opportunistic Service Oriented Approach for Robot Search; Allen Hanson, Roderic Grupen, Advisors; Feb. 2015; Senior Software Engineer, Autodesk Inc.

Limin Yao; Universal Schema for Knowledge Representation from Text and Structured Data; Andrew McCallum, Advisor; Feb. 2015; Software Engineer, Twitter Inc.

See details on the graduates’ research at: cics.umass.edu/phdgrads_febmay15

In July, CICS faculty, graduate students, an alum, and even a future faculty member got together for a photo op at the International Conference on Machine Learning 2015 in Lille, France. Back (l. to r.): Philip Thomas, Akshay Krishnamurthy, Benjamin Marlin, Kevin Winner; Front (l. to r.): Yariv Levy (Ph.D. ’12), David Belanger, Andrew McCallum, Tao Sun

CICS Undergraduate Dean’s List – Spring 2015

See the full Spring 2015 Dean’s List and the list of student citations (students recognized for their outstanding performance in the classroom) at cics.umass.edu/people/spring-2015-deans-list-and-citations.