Gaurav Kharkwal

Contact Information

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Work Experience

Bloomberg LP, New York, NY
UI Infrastructure Developer Aug 2014 - Present
- Developed and maintained client-side applications and services for the Bloomberg Terminal.
- Developed and maintained UI framework/widgets used by app-developers to write front-end code.

Rutgers University, New Brunswick, NJ
Web Developer, Dept. of Psychology Sept 2011 - Sept 2013
- Developed a website using PHP for running behavioral experiments as part of an online lab course.
- Coded experiments as Java applets, which additionally collected and parsed data.
- Wrote detailed user-guides and teaching aids for the online course.

Microsoft, India Development Center
Software Development Engineer - Intern Apr 2008 - Jul 2008
- Worked with the Visual Studio Test Professional team to develop a framework for bug reporting.
- System allowed creation of test cases out of existing bugs and vice versa.
- Created a UI using WPF and XAML to facilitate bug reporting.

Technical Skills

Programming Languages:
- C++, Javascript, Python
- Prior experience in: Java, PHP, MySQL

Statistical Languages:
- R, Matlab, SPSS, Excel

Education

Rutgers University, New Brunswick, NJ
Ph.D., Cognitive Psychology (GPA: 4.0) 2014
M.S., Computer Science (GPA: 4.0) 2014
M.S., Cognitive Psychology (GPA: 4.0) 2011
- Awarded the Excellence in Dissertation Fellowship in the academic year 2013-2014.
- Authored and co-authored publications in peer-reviewed journals.
- Presented research findings as talks and posters to peers in competitive academic conferences.

International Institute of Information Technology, Hyderabad, India
B.Tech., Computer Science and Engineering *Hons.* (GPA: 9.04/10) 2009
- Included in the Dean's List every year from 2005 to 2009 for excellence in academic performance.
- Ranked in the top 10 of the graduating class of 2009 for achieving academic distinction.

Relevant Coursework

- Research Design & Analysis
- Model Testing & Probabilistic Inference
- Data Structures & Algorithms
- Numerical Analysis
- Principles of Artificial Intelligence
- Machine Learning
- Natural Language Processing
- Language & Information

Relevant Projects

Syntactic Complexity as a Feature for Automatic Essay Scoring *Course Project*, Spring '13
- Evaluated syntactic complexity as a feature for automated essay scoring using 12,000 TOEFL essays.
- Quantified syntactic complexity as processing difficulty during reading with a psycholinguistic model called *surprisal*.
- Obtained processing complexity per word for every essay using a parser trained on WSJ corpus.
- Extracted and organized data using Python, and analyzed them by performing correlation tests and building classification models on R.
- Found significant inverse correlation indicating simpler sentences are linked with better essay scores.
- Presented findings at an ACL workshop.

Ontology-based Semantic Parsing *MS in CS*, 2012 - 2013

- Created a semantic parser using a constraint-based grammatical framework to produce ontological meaning representations for given sentences.
- Developed an NLTK-inspired grammar module and a bottom-up chart parser in Python.
- Compared parser with an equivalent CFG parser by collecting performance statistics and analyzing them via linear mixed-effects regression models.
- Code available at: github.com/gkharkwal/LWFGParser

Human Sentence Processing with Word-level Noise *PhD in Cog Psych*, 2011 - 2014

- Investigated how people comprehend sentences containing unknown words.
- Developed web-based and offline experiments from scratch using Python, PHP, and Java.
- Cleaned and analyzed data using Python, R, and MATLAB.
- Developed Bayesian models of sentence processing that integrated noisy word recognition by performing corpus analysis on large-scale textual data.
- Discovered influence of prior grammatical information on comprehension of unknown words.

Linguistic Representations of Visual Events *MS in Cog Psych*, 2009 - 2011

- Evaluated two theories of human language comprehension by developing a new experimental paradigm.
- Used Python to create experimental stimuli from scratch and to collect and parse data.
- Analyzed data with traditional and Bayesian techniques using R and MATLAB.

Leadership Experience

Rutgers University, New Brunswick, NJ

Research Mentor Sept 2009 - June 2014

- Advised and mentored undergraduate students on research projects.
- Guided them through various stages of research, including project conception, data collection, data analysis, and presentation of results.

Teaching Assistant Sept 2009 - Sept 2013

- Conducted lab sessions for *Sensation & Perception* and *Cognition* courses for groups of 20 students.
- Supervised students in final projects, and graded weekly assignments.
- Obtained TA certificate for *Teaching with Technology*.

International Institute of Information Technology, Hyderabad, India

Teaching Assistant Aug 2007 - May 2009

- Organized and evaluated lab sessions on *Data Structures & Algorithms* where 30 students coded solutions to algorithmic problems.
- Led weekly recitation sessions with groups of 50-150 students for the following courses: *Digital Logic Design*, *Networks*, and *Database Mgmt Systems*.

Selected Publications

Kharkwal, G. and Muresan, S. (2014). "Surprisal as a Predictor of Essay Quality." *The 9th Workshop on Innovative Use of NLP for Building Educational Applications at ACL*, 54-60, Baltimore, MD.

Kharkwal, G. and Stromswold, K. (2014). "Good-enough language processing: Evidence from sentence-video matching." *Journal of Psycholinguistic Research*, 43(1), 27-43. doi:10.1007/s10936-013-9239-5.

Lee, C., **Kharkwal, G.**, and Stromswold, K. (2012). "Temporal transitions in narrative production with wordless picture books." *LSA Annual Meeting Extended Abstracts*, elanguage.net.