

KUMARA SASTRY, Ph.D.

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Education

PhD, Systems and Entrepreneurial Engineering, [University of Illinois at Urbana-Champaign](#), 2007.

Dissertation: “Genetic algorithms and genetic programming for multiscale modeling: Applications in materials science and chemistry and advances in scalability.”

MS, General Engineering, [University of Illinois at Urbana-Champaign](#), 2002.

MSc (Hons) Chemistry & ME Chem. Eng., [Birla Institute of Technology and Science](#), Pilani, India, 1999.

Academic Experience

Graduate Research Assistant ◊ [University of Illinois at Urbana-Champaign](#) ◊ 2000 - 2007.

- Developed a multiscaling method for *fast* and *accurate* quantum chemical reaction simulations bridging *ab initio* and semiempirical methods (Multiobjective optimization, C/C++, Fortran).
- Developed a multiscaling approach spanning 15-orders in time for materials kinetics simulation by bridging kinetic Monte Carlo and molecular dynamics (Genetic programming, C/C++).
- Designed principled *efficiency-enhancement* techniques that yield *super-multiplicative* speedups.
- Implemented efficient parallel genetic algorithm that solves problems with *over billion* variables (Altivec, SSE2, MPI, C/C++).
- Invented methodologies led to *six patent* filings.

Graduate Teaching Assistant ◊ [University of Illinois at Urbana-Champaign](#) ◊ 2006.

- Held review sessions, graded homework, projects, and exams for a probability & statistics course of 120 students. Answered questions in office hours and served as a mentor to undergraduate students.

Graduate Research Assistant ◊ [State University of New York at Buffalo](#) ◊ 1999.

- Non-linear optimization (MINOS, GAMS, NPSOL) of hybrid power cycles.

Project Assistant ◊ [Birla Institute of Technology & Science, Pilani](#). ◊ 1996-1999.

- Developed a genetic algorithms and fuzzy-logic based pH control system (C).
- Developed a solution manual for the textbook: *Control Systems* by I. J. Nagrath (Matlab).

Teaching Assistant ◊ [Birla Institute of Technology & Science, Pilani](#) ◊ 1998.

- Handled the laboratory for senior-level process control course.

Professional Experience

Software Engineer (R&D) ◊ [Intel Corp.](#) ◊ 2007-present.

Research and development of scalable, efficient, and robust computational lithography methods that are the principal enablers of Moore’s law and critical for manufacturing of current and future Intel processors.

Consultant ◊ [Quelab Inc.](#) ◊ 2007.

- Consulting on genetic algorithms for accurate and robust culture media classification.

Consultant ◊ [Nextumi Inc.](#) ◊ 2004-2007.

- Involved with the design and development of core technology of Nextumi, a web 2.0 start-up that simplifies sharing among people across different devices.

Consultant ◊ [Schema Inc.](#) ◊ 2002-2004.

- Consulted on competent and efficient genetic algorithms for wireless optimization problems. Invented new search operators that led to a 30-50 times faster GA and 2–5 times improvement in solution quality.

Administrative Experience

Student Lab Director \diamond *Illinois Genetic Algorithms Laboratory* \diamond 2002-2007.

- Interacting with students, visiting scholars and professors, and industrial contacts.
- Designed and led assembling and upgrading efforts of a 93-node diskless PC cluster.
- Coordinating and supervising system- and web- administrators, and librarian.

Chair, Estimation of Distribution Algorithms Track \diamond *Genetic and Evolutionary Computation Conference (GECCO) (ACM SIGEVO conference)* \diamond 2008 and 2009.

- Managing (Review assignments and accept/reject decisions) EDA track.

Co-Chair, Genetic Algorithms Track \diamond *GECCO (ACM SIGEVO conference)* \diamond 2007.

- Managed GA track, the largest track in the largest conference on evolutionary algorithms.

Co-organizer \diamond *Workshop on Optimization by Building & Using Probabilistic Models* \diamond 2001-2008.

- Managing and Running an annual workshop at GECCO.

Electronic publicity chair \diamond *Genetic and Evolutionary Computation Conference* \diamond 2002.

- Handled email postings, press releases, postings to newsgroups and mailing lists.

Awards & Grants

- Bronze “Humies” award, [Human Competitive Results](#), 2007.
- Finalist, Lemelson-Illinois student prize. [Annual award for most inventive student](#), 2007.
- Silver “Humies” award, [Human Competitive Results](#), 2006.
- Best paper award \diamond *estimation of distribution algorithms*, [GECCO, 2007](#). \diamond *real world applications*, [GECCO, 2006](#). \diamond *learning classifier systems*, [GECCO, 2003](#).
- Research Grant FA9550-06-1-0096. Air Force Office of Scientific Research, USAF.
- Co-authored paper chosen by American Institute of Physics editors as a focused article of frontier research in the [Virtual Journal of Nanoscale Science and Technology](#), 12(9), 2005.
- Best paper award nominee \diamond *genetic algorithms*, [GECCO, 2007](#), [GECCO, 2003](#). \diamond *estimation of distribution algorithms*, [GECCO, 2007](#), [GECCO, 2005](#).
- [Computational Science and Engineering Fellow](#), University of Illinois, 2002-2003.
- [William A. Chittenden Award](#) for outstanding MS graduate in General Engineering, 2001.

Selected Publications

Summary: Co-authored/edited 2 books \diamond 12 refereed journal papers \diamond 15 book chapters \diamond 54 refereed conference papers \diamond 7 refereed conference posters \diamond 7 workshop/conference papers \diamond 13 technical reports.

h-index: 16 \diamond **Total citations:** 841

Goldberg, D. E., Sastry, K. (In preparation). *Genetic algorithms: The design of innovation*. 2nd edition. Berlin: Springer.

Pelikan, M., Sastry, K., Cantú-Paz, E. (Eds.) (2006). *Scalable optimization via probabilistic modeling: From algorithms to applications*. Berlin: Springer.

Sastry, K., Johnson, D. D., Goldberg, D. E., Bellon, P. (2005). Genetic programming for multi-timescale modeling. *Physical Review B*, 72, 085438.

Sastry, K., Johnson, D.D., Thompson, A. L., Goldberg, D. E., Martinez, T. J., Leiding, J., Owens, J. (2006). Multiobjective genetic algorithms for multiscaling excited state direct dynamics in photochemistry. *Genetic and Evolutionary Computation Conference (GECCO 2006)*. 1745–1752.

Sastry, K., Goldberg, D. E. (2003). Probabilistic Model Building and Competent Genetic Programming. In Riolo, R., Worzel, B. (Eds.), *Genetic Programming Theory and Practice*, 205–220. Boston, MA: Kluwer Academic Publishers.