KUMARA SASTRY

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Education

PhD, Systems and Entrepreneurial Engineering, University of Illinois at Urbana-Champaign, anticipated graduation date: October 2007.
Dissertation: "Genetic algorithms and genetic programming for multiscale materials modeling: Applications and advances in scalability."

MS, General Engineering, University of Illinois at Urbana-Champaign, 2002.

MSc (Hons), Chemistry & ME, Chemical Engineering, Birla Institute of Technology and Science, Pilani, India, 1999.

Academic Experience

Graduate Research Assistant ◇ *University of Illinois at Urbana-Champaign* ◇ 2000 - Present.

- 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++).
- Led a team of 7 that developed advanced genetic algorithm toolbox for Caterpillar Inc. (C++).
- Invented methodologies led to *six patent* filings.

Graduate Teaching Assistant ◇ *University of Illinois at Urbana-Champaign* ◇ 2006.

- Held review sessions for a probability & statistics course of 120 students.
- Graded homework, projects, and exams.
- 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

Consultant ◇ *Nextumi Inc.* ◇ 2004-present.

- 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.
- Planning, coordinating, and supervising research efforts related to current and future products.

Consultant ◇ *Schema Inc.* ◇ 2002-2004.

- Consulted on competent and efficient genetic and evolutionary algorithms for wireless optimization problems for Schema, a leading wireless solution provider.
- Invented new search operators that sped up GAs by a factor of 30–50 and improved solution quality by factor of 2–5.

Administrative Experience

Student Lab Director ◇ *Illinois Genetic Algorithms Laboratory* ◇ 2002-Present.

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

Co-Chair, Genetic Algorithms Track ◇ *Genetic and Evolutionary Computation Conference (GECCO) (ACM SIGEVO conference)* ◇ 2007.

- Managed GA track, the largest track in the largest conference on evolutionary algorithms.
- Handled review assignments, made acceptance/rejection decisions

Co-organizer ◇ *Workshop on Optimization by Building & Using Probabilistic Models* ◇ 2001-2007.

- Managing and Running an annual workshop at GECCO.

Electronic publicity chair ◇ *Genetic and Evolutionary Computation Conference* ◇ 2002.

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

Awards & Grants

- Finalist, Lemelson-Illinois student prize. Annual award for most inventive student, 2007.
- Silver "Humies" award, Human Competitive Results, 2006.
- Best paper award ◇ *estimation of distribution algorithms*, GECCO, 2007. ◇ *real world applications*, GECCO, 2006. ◇ *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 ◇ *genetic algorithms*, GECCO, 2007. ◇ *estimation of distribution algorithms*, GECCO, 2007. ◇ *estimation of distribution algorithms*, GECCO, 2005. ◇ *genetic algorithms*, GECCO, 2003.
- 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 2 books ◇ 12 refereed journal papers ◇ 12 book chapters ◇ 48 refereed conference papers ◇ 7 refereed conference posters ◇ 6 non-refereed workshop/conference papers ◇ 12 technical reports.
h-index: 12 ◇ **Total citations:** 471

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.