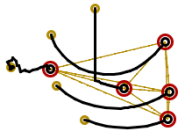

Résumé

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Desire

To develop and explore new technologies. To learn new things while using my extensive experience in computer science and applied mathematics.

Computer skills

Know well	**Know**	**Learning**
C, C++, STL, Java, OpenGL, Python	PHP, SQL, Html, MFC, Matlab, FORTRAN77, Fortran90, Linux (user), Processing.org	MySQL with PHP, CSS, Javascript

In addition, I also have either academic or industrial experience with distributed algorithms, applied mathematics, algorithm development, control theory, robotics, computer graphics, bayesian statistics and machine learning.

Education

Please note that I have 5 years of industry experience between finishing my BS in CS and starting graduate school.

- PhD in Applied Math and Statistics, University of California, Santa Cruz, June 2009
- MS in Computer Science, University of California, Santa Cruz, June 2008
- BS in Computer Science, Carnegie Mellon University, May 2000

Experience

Researcher — University of California, Santa Cruz
2005 - 2009

- Performed a systematic study of distributed algorithms to maintain wireless network connectivity in swarms of mobile robots.
- Three research threads
  - Discrete distributed spanning tree algorithms designed to be coupled with continuous control laws [3, 6, 7].
  - Partial information approach to maintaining the graph Laplacian of a network induced by robot positions [4, 5].
  - Improved on coordination algorithms for a practical robotic spacecraft design developed at JPL [2].
- Tools, techniques and skills
  - Mathematical proof
    * Linear Algebra
    * Control theory
    * Distributed algorithms
    * Graph theory
  - Simulation [1]
    * Java / applets / awt
    * Framework for plugging in and composing agent control algorithms
    * Online (visual) or offline (data collection)
    * Data display in python
- Thesis at `http://tintoretto.ucsd.edu/jorge/group/data/PhDThesis-MikeSchuresko-09.pdf`

Teaching Assistant — University of California, Santa Cruz
Sep 2007 - Jun 2008 — Taught integration and differentiation. Led recitations.

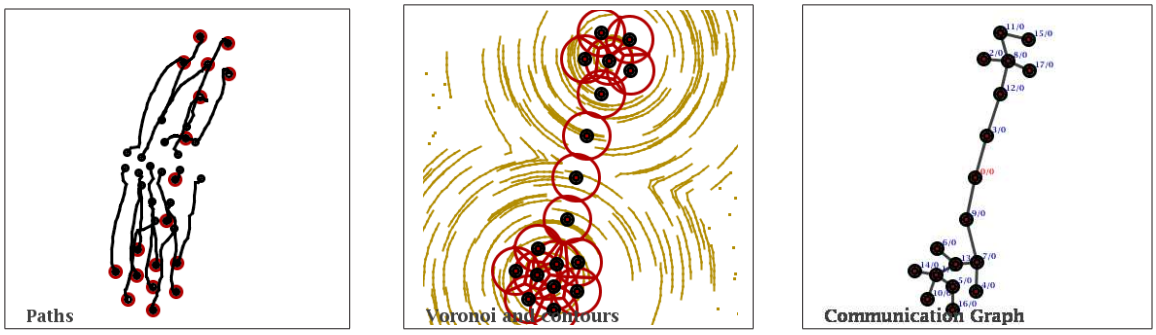
Programmer Sep 2001 - June 2005	CommonPoint Inc (`http://www.commonpointinc.com`)

- What we did
  - 3d training and construction planning tools for the chemical process plant industry.
  - Chemical process plants poses challenges not faced in other 3d domains.
    - high polygon count
    - high geometric complexity (exposed piping and machinery)
- Tools we used
  - C++ for Win32
  - Third-party CAD tools, Sense8 scenegraph toolkit
  - SQL, XML for data storage / exchange
- Contributed significantly to
  - viewpoint and model loading managment, path planning, 3d navigation and interaction,
  - collision detection, clash detection
  - surface tesselation, CAD file format conversion.
- Development practice
  - Between 5 and 10 developers (team size changed over time)
  - Initially ad-hoc development practice
  - Eventually had design review, agile methods, pair programming and unit tests.
  - My responsibility included software design.

Programmer Sep 2000 - June 2001	Sense8 Maintained and improved a mature 3d visualization and simulation package. Most of my experience here was fixing bugs rather than developing or designing new code, as Sense8's codebase was an extremely mature and stable product. Here I honed my skills for exploring, navigating, and understanding large software projects.
Intern Summer 1999	Terrasim (`http://www.terrasim.com`) Helped integrate 3d building models into geospatially accurate tesselated 3d scenes.
Intern Summers 1997, 1998	Naval Center for Applied Research in Artificial Intelligence Wrote support code for research in robotics and genetic algorithms. Was one of three software developers on the team that won the "Technical Merit" prize for one of the AAAI robotics competitions at the 1997 AAAI (American Association for Artificial Intelligence) conference. Extended a public domain flight simulator to serve as a flying robot simulator for a learning experiment. Adapted Java visualizations of robot learning simulations to different learning experiment contexts.

References

[1] M. D. Schuresko. CCLsim. a simulation environment for robotic networks, 2008. Electronically available at http://www.soe.ucsc.edu/~mds/cclsim.



(a) (b) (c)

Figure 1: The plots show an execution of the algorithm presented in [3, 6, 7], showing (a) the paths taken by the robots, (b) a contour plot of the density field and the sensor coverage regions of the robots, (c) the final network constraint tree.

[2] M. D. Schuresko and J. Cortés. Correctness analysis and optimality bounds of multi-spacecraft formation initialization algorithms. In *IEEE Conf. on Decision and Control*, pages 5974–5979, San Diego, CA, December 2006.

[3] M. D. Schuresko and J. Cortés. Safe graph rearrangements for distributed connectivity of robotic networks. In *IEEE Conf. on Decision and Control*, pages 4602–4607, New Orleans, LA, 2007.

[4] M. D. Schuresko and J. Cortés. Distributed motion constraints for algebraic connectivity of robotic networks. In *IEEE Conf. on Decision and Control*, pages 5482–5487, Cancun, Mexico, December 2008.

[5] M. D. Schuresko and J. Cortés. Distributed motion constraints for algebraic connectivity of robotic networks. In *Journal of Intelligent and Robotic Systems*, 2009. To appear.

[6] M. D. Schuresko and J. Cortés. Distributed tree rearrangements for reachability and robust connectivity. In R. Majumdar and P. Tabuada, editors, *International Conference on Hybrid Systems: Computation and Control*, volume 5469 of *Lecture Notes in Computer Science*, pages ***–***, New York, 2009. Springer.

[7] M. D. Schuresko and J. Cortés. Distributed tree rearrangements for reachability and robust connectivity. *SIAM Journal on Control and Optimization*, 2009. Submitted.