

Permanent Address:
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Present Address
143 Albany St, Apt 326B.
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Shkolnik@mit.edu

Alexander C. Shkolnik

EDUCATION

Massachusetts Institute of Technology (MIT)

PhD in Artificial Intelligence, focus on control for walking robots
Advisor: Russ Tedrake, Robot Locomotion Group

Cambridge, MA
2003 – 2008 (expected)

Emory University, 4.0 / 4.0 GPA in CS / Math major, 3.8 overall

M.S. in Computer Science/Mathematics
Advisor: Steve Potter, Laboratory for NeuroEngineering, GA Tech.

Atlanta, GA
August 2003

B.S. in Computer Science/Mathematics, Summa Cum Laude
2nd major in Neuroscience and Behavioral Biology

May 2003

ACADEMIC HONORS

NSF / JSPS EAPSI Fellowship, summer 2007

National Science Foundation Graduate Research Fellowship, 2003-2006

Graduated with Highest Honors (Summa Cum Laude) in CS / Math, Emory, 2003

Accelerated 4 yr B.S. / M.S. program in Computer Science / Mathematics, Emory

Emory University Dean's List

Who's Who Among Students in American Universities and Colleges, 2002

Summer Undergraduate Research at Emory (SURE) Fellowship, 2001 and 2002

Barry M. Goldwater Scholarship for Excellence in Science - honorable mention, 2002

The National Dean's List, 2000

Golden Key, international academic honor society, member since 2003 (top 15% of Emory class)

Phi Beta Kappa, national academic honor society, member since 2002

Omicron Delta Kappa, national leadership honor society, member since 2002

Nu Rho Psi, neuroscience honor society, member since 2001

PEER - REVIEWED PUBLICATIONS

Doshi, F., et al. "A Supervised Learning Approach for Collision Detection in Legged Locomotion." Submitted to 2007 IEEE International Conference on Intelligent Robots and Systems (IROS).

Shkolnik A., Tedrake, R. "Inverse Kinematics for a Point-Foot Quadruped Robot with Dynamic Redundancy Resolution." 2007 IEEE International Conference on Robotics and Automation (ICRA).

Shkolnik N., Shkolnik A. (2005). "High Efficiency Hybrid Cycle Engine." Proc. ASME Internal Combustion Engine Conference, ASME paper ICEF2005-1221

Kreiman G., Chou, H., Shkolnik, A., Poggio, T., and DiCarlo, J. (2004). "Object recognition by selective spike and LFP data in inferior temporal cortex." (San Diego: Society for Neuroscience)

Potter, S., et al. (2004). "Hybrot: Hybrids of living neurons and robots for studying neural computation," in Proc. Brain Inspired Cognitive Systems BICS2004, Scotland, UK.

Bakkum, D. J., Shkolnik, A. C., Ben-Ary, G., Gamblen, P., DeMarse T. D., and Potter, S. M. (2004) "Removing the 'A' from AI: Embodied Cultured Networks" in Proceedings of the Dagstuhl Conference on Embodied Artificial Intelligence, Luc Steels and Rolf Pfeiffer, editors, Springer.

Shkolnik A., (2003). "Neurally controlled simulated robot: applying cultured neurons to handle an approach / avoidance task in real time, and a framework for studying learning in vitro." Masters Thesis, Department of Computer Science, Emory University. Advisor Steve Potter, GA Tech.

OTHER PUBLICATIONS & PRESENTATIONS

Shkolnik, A., Byl, K., Rohanimanesh, K., Roy, N., Tedrake, R. "Walking on Rough Terrain with a Position Controlled Quadruped Robot." International Workshop on Legged Locomotion for Young Researchers, April 2007, MIT.

Ben-Ary, G., Potter S, DeMarse T, Shkolnik A, T., Sweetman, I., Gamblen, P., Zurr, I., Catts, O., (2002). "The current status of research into Meart – the semi living artist – Stage 2." Biennale of Electronic Arts Perth symposium: The Aesthetics of Care, p59-62.

Shkolnik, A., et al., (August 2002). "Neurally Controlled Robotic Drawing Arm - MultiElectrode Array Art (MEART)," SURE Poster Symposium, Emory University, Atlanta, GA.

Shkolnik, A., Edwards, D., (August 2001). "Is the Medial Nucleus of the Amygdala Important for Mating in Male Mice," SURE Poster Symposium, Emory University, Atlanta, GA.

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PATENTS

Shkolnik, N., Shkolnik, A. (2007). "Hybrid Cycle Combustion Engine" (Pending)
Shkolnik, N., Shkolnik, A. (2006). "Modified Hybrid Cycle Rotary Combustion Engine and Methods."
(Pending)
Shkolnik, N., Shkolnik, A. (2004). "Hybrid Cycle Combustion Engine." (Pending)

RESEARCH & TEACHING

National Inst. of Advanced Industrial Science and Technology (AIST) Tsukuba, Japan
NSF / JSPS EAPSI Research Fellow Summer 2007

- Will apply RL techniques on HRP-2m to achieve roll over toe during walk

Massachusetts Institute of Technology Cambridge, MA
Teaching Assistant, Course 6.881: Underactuated Robotics Spring 2007

- Helping to develop the course with Prof. Russ Tedrake; responsibilities include developing problem sets, helping students with problem sets and projects, and grading

Research Assistant, Robot Locomotion Group 2005 – present

- Developing control algorithms for the DARPA "Learning Locomotion" project using the LittleDog quadruped robot developed by Boston Dynamics, Inc.; developed a whole-body Jacobian based controller; working on improving walking stability over rough terrain.
- Studying biologically inspired mechanisms and control algorithms, and Reinforcement Learning

Research Assistant (and NSF Graduate Research Fellow), CBCL 2003 – 2005

- Decoding visual stimuli from electrical recordings in IT cortex in macaque monkeys

Georgia Institute of Technology, Neuroengineering Lab Atlanta, GA
Research Fellow (SURE, Center For Behavioral Neuroscience) 2002 - 2003

- Studied plasticity in cultured neural networks of dissociated cortical rat brain tissue
- Developed a neurally controlled robot that follows a reference object (or another robot) and maintains a given distance (similar to a car on autopilot).
- Worked with the University of Western Australia to develop MultiElectrode array ART (MEART). Data from a cultured neural network was processed in real-time and was used to control a robotic drawing arm at the Biennale of Electronic Arts Perth festival

Emory University Atlanta, GA
Research Fellow (SURE) 2001 – 2002

- Studied the role of the medial nucleus of the amygdala in social memory in mice; research included electrolytic and excitotoxin brain lesioning, behavioral testing, histology, etc.

WORK EXPERIENCE

LiquidPiston, Inc. West Hartford, CT
Cofounder, Co-inventor of technology 2003 - Present

- Developing a novel internal combustion engine, including engineering and modeling
- Award winners in: MIT \$50k Competition (2004); MIT Enterprise Forum Clean Energy Competition (2005); GE / Dow Clean Energy Competition (2006)
- SBIR Phase I Award from DOE / Army (2007)

Emory University Atlanta, GA
Computer Lab Coordinator, Graduate School of Psychology 1999 - 2003

- Provided technical support and ensured that the computer lab was functioning smoothly
- Assisted students and faculty with various computer issues and multimedia equipment

Agency Management Services (AMS) Windsor, CT
ASP Programmer and Systems Engineer 1999 – 2001

- Assisted in developing QuoteNetworks.com, including testing procedures

Quest Systems, Inc. West Hartford, CT
General Manager, Computer Consultant 1993-2000

- Consulted in various hardware and software projects; integrated and resold computer systems

Invention Machine Corporation Boston, MA
Engineering Intern Summer 1998

- Designed a micro-valve for use in refrigerators made by a company in Germany

MISC.

Programming experience in Java, C/C++, ASP, HTML, JavaScript, Matlab, Pascal, Eosys
A+ certified computer technician (Comptia) – 100% customer satisfaction rating
Fluent in Russian