

# Andrei Barbu

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<http://0xab.com>

## Skills

extensive knowledge of algorithms, strong mathematics background, computer vision, visual perception, operating-system design, machine learning, cognitive science, compiler design, parallel programming, computer networks, semantic web, ontologies, linguistics, automatic differentiation, stochastic and nondeterministic programming languages, functional programming, logic and constraint programming, contributions to open-source projects

## Languages

Haskell, Scheme, C++, Lisp, C, Prolog, MATLAB, Java, OCaml, Python, SQL, VHDL, x86 and MIPS assembly  
native English and Romanian, competent German, basic French

## Education

### PhD student, Artificial Intelligence

*Jan. 2008 – present*

Purdue University, Professor Jeffrey M. Siskind

language and high-level reasoning for solving inverse vision and manipulation problems  
machine learning situated in the real world using custom robots  
stochastic modeling via probabilistic programming  
grounding language in vision and robotic manipulation  
optimization of large stochastic cognitive models  
segmentation and tracking of objects in videos with high-level semantic priors  
<http://0xab.com/research/>

### Bachelor of Computer Science

*2004 – 2008*

University of Waterloo

complexity theory, real-time operating systems, graph theory, algorithm design, programming languages, medical imaging, linear programming, coding theory

## Publications

### Learning physically-instantiated robotic game play through visual observation

*May 2010*

Andrei Barbu, Siddharth Narayanaswamy, Jeffrey Mark Siskind  
*Proceedings of 2010 IEEE International Conference on Robotics and Automation*  
<http://0xab.com/icra2010/>

### A visual language model for estimating object pose and structure in a generative visual domain

*May 2011*

Siddharth Narayanaswamy, Andrei Barbu, Jeffrey Mark Siskind  
*Proceedings of 2011 IEEE International Conference on Robotics and Automation*  
<http://0xab.com/icra2011/>

## Employment History

### Research Assistant

*Jan. 2008 – present*

Professor Jeffrey M. Siskind

Purdue University, USA

solved computer-vision and manipulation problems using AD-based optimization  
designed and built custom special-purpose robots  
implemented stochastic programs to use and produce language  
TA for ECE473 and ECE570, Artificial Intelligence  
participated in the DARPA *Mind's Eye* program to develop action recognition systems  
developed new robust segmentation and tracking methods for people and objects  
processed millions of frames of video on a top-500 supercomputer

**Software Development Engineer**  
Amazon.com

*May 2010 – August 2010*  
Seattle, USA

migrated from a monolithic database design to a distributed service-oriented system  
designed & developed distributed services to collect metrics about internal systems  
coordinated with other teams to develop internal tools and alarms

**Kernel Developer**

Google Summer of Code 2008 – the GNU Hurd

*May 2008 – August 2008*  
Purdue University, USA

designed and implemented an instrumentation framework for GNU Mach  
implemented the DWARF2 debugging standard  
debugger improvements  
bug fixes and other new features

**Undergraduate Research Assistant**

Professor Jeffrey M. Siskind

*July 2006 – September 2006*  
Purdue University, USA

numerous improvements to a C frontend, including updates for C99 and GNUC  
improvements to the existing Scheme compiler  
ported the Scheme→C compiler to x86-64  
ported various other applications to x86-64  
significant performance improvements

**Software Developer and Knowledge Systems Architect**

Dalin Software SA

*July 2005 – May 2006*  
Laussane, Switzerland

ontology, temporal, and spatial logic frameworks  
designed extensions to OWL, the Ontology Web Language  
designed and developed tools for querying and updating OWL+SWRL ontologies

**Server Administrator**

Adrex Consulting

*2003 – 2008*  
Toronto, Canada

maintained a network of Linux servers and Windows workstations

**Developer and Server Administrator**

Iflipout.com

*Sept. 2002 – March 2003*  
Toronto, Canada

developed complex network text-based games in C and C++  
maintained the internal Linux network  
developed and maintained an extensive set of unit tests  
helped debug and solve difficult issues in the customers' existing C and C++ code