Michael Hansen

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Supervisory Control and Cognition (RHCI)
711th Human Performance Wing
Air Force Research Lab

Education

- **Ph.D. in Computer Science and Cognitive Science** (2015)
  - Indiana University (IU)
- **M.S. in Computer Science** (2012)
  - Indiana University (IU)
- **B.S. in Computer Science** (2006)
  - University of Wyoming (UW)

Work Experience

- **Computer Scientist** for the Air Force Research Lab (31 Mar 2014 - present)
  - Working on agent frameworks, autonomy, and intelligence/surveillance/reconnaissance.
- **Contract programmer and Repperger intern** for the Air Force Research Lab (1 Sep 2012 - 30 Mar 2014)
  - Developed cognitive modeling enhancements to agents in a simulated task environment.
  - Simulated cognitive agents using a distributed networking infrastructure.
  - Transitioned the CECEP cognitively-enhanced complex event processing architecture to a net-centric implementation using ZeroMQ.
  - Designed and implemented a qualitative spatial array capability with ego-centric visibility polygons.
  - Assisted in design of an intelligence/surveillance/reconnaissance (ISR) agent.
- **Research assistant** for CREST at IU (1 Sept 2009 - 31 Dec 2013)
  - Created computational cognitive model for results of eye-tracking experiment.
  - Designed and ran program comprehension experiment using a Tobii TX300 eye-tracker for local participants and Mechanical Turk for remote participants.
  - Wrote software for processing and rendering plenoptic lightfields using GPU shaders ($C^{\#}$, DirectX).
  - Implemented and optimized algorithms for Schrieber's Transfer Entropy measure, available in the Transfer Entropy Toolbox (MATLAB/C, C++).
  - Implemented algorithms in the Boost Graph Library for McGregor common subgraphs and multi-dimensional grid-graphs (C++).
- **Associate instructor** for Advanced Operating Systems - CSCI-P 536 at IU at IU (Fall 2012)
  - Graded coding assignments and conducted one-on-one student code reviews.
  - Taught weekly lab section and several lectures.
- **Repperger intern** for the Air Force Research Lab (10 Jun - 18 Aug 2012)
  - Designed and implemented a cognitively-enhanced complex event processing infrastructure using Esper and Scala.

- – Created agents for a checkpoint scenario using Unreal Tournament and Google Maps.
  - – Assisted in the design of meta-models for the graphical development of behavioral models in the Generic Modeling Environment.

- **Contract programmer** for Quartermain Inc. (1 Jan 2006 - 15 Dec 2013)
  - – Implemented and maintained the ExcelCube spreadsheet consolidation desktop application (C$^\#$, Windows Forms, see link for details).

- **Student programmer** for the Percepts and Concepts Lab at IU (1 Sept 2008 - 1 Sept 2009)
  - – Designed and implemented several cross-platform research games (C$^\#$, Mono Framework, OpenGL). See personal web site for details.

- **Contract programmer** for Logical Information Machines (1 Aug 2007 - 1 Aug 2008)
  - – Designed and implemented a desktop application for querying and visualizing stock-market data from an in-house time-series database (C$^\#$, Windows Presentation Foundation).

- **Contract programmer** for HappyJack Software LLC (1 Jan 2007 - 1 Aug 2008)
  - – Designed and implemented a student records web management system for the UW School of Nursing (C$^\#$ ASP.NET, MySQL, 100's of students, 10's of users)
  - – Implemented a two-way synchronization plug-in for Microsoft Outlook and the web-based Kalendi product (C$^\#$, VB.NET, SyncML)

- **Co-founder and lead programmer** for chapaCode Inc. (1 Jan 2003 - 1 Aug 2007)
  - – Designed, implemented, and maintained web-based student management system for UW College of Education (C$^\#$, ASP.NET, SQL Server, 100's of students, 10's of users)
  - – Implemented database and reporting website for The Center for Performance Assessment and the state of Nevada (C$^\#$, ASP.NET, Sqlite)
  - – Designed, implemented, and maintained legal records and reporting system for the Laramie, WY City Attorney's office (C$^\#$, Windows Forms, SQL Server, Microsoft Word)

- **Student programmer** for multiple UW departments (1 Jan 2002 - 31 Dec 2005)
  - – **Mechanical Engineering** (2004-2005): Implemented CALISYS program (see Publications).
  - – **Student Educational Opportunities** (2004-2005): Administered student database, automated tasks and reports for staff.
  - – **Admissions** (2003-2004): Administered database and automated tasks for staff (e.g. detecting duplicate students, assigning e-mail addresses).
  - – **Computer Science** (2002-2003): Created utility programs for lab assistants to access Novell Directory Services.

Skill Set

- **Programming Languages**
  - – Python, Java (4 years professional experience).
  - – C$^\#$ (9 years professional experience), C++ (10 years personal, educational experience).

- **Statistics and Modeling**
  - – Publication experience with `pandas`, `statsmodels`, and `sklearn`, `matplotlib` libraries in Python.
  - – Basic statistics/plotting experience with R.

- **GUI and Game Development**
  - – Windows Forms, WPF, GTK+, Android.

- – 2-D/3-D game development in OpenGL. Experience with DirectX, SDL, CUDA.
- **Databases**
  - – Design and maintenance of production databases in MySQL, PostgreSQL, SQL Server, SQLite.
- **Web Development**
  - – Design and implementation of data-driven websites (ASP.NET, PHP, Python, Ruby on Rails).
- **Administration**
  - – 6 years Linux server administration experience.

Honors and Organizations

- **Software Carpentry Bootcamp Instructor** (2012-present)
  - – Instructor for Software Carpentry bootcamps at Indiana University, Howard Hughes Medical Institute, and Purdue University.
- **Nominated for UW Student Employee of the Year** (2006)
  - – Nominated for my work on the Computer-Aided Laboratory Instruction System (CALISYS) project, a virtual lab environment similar to LabView for students to collect, manipulate, and visualize real-time measurement data ($C^{\#}$, Windows Presentation Foundation).
- **Microsoft Most Valuable Professional** in Visual $C^{\#}$ (2004-2005)
  - – Received for my work with the Wyoming ACM chapter as President and activity organizer.
- **4th place regional winner for Microsoft Imagine Cup** (2004)
  - – Received for the ShopNET application, which provided a 3-D multi-user environment for purchasing books from Amazon. Users inhabited a virtual bookstore that was populated with real products using Amazon Web Services. The application was written in $C^{\#}$ and used a custom OpenGL engine which was compatible with Quake 3 maps and models.
- President of the Wyoming Association of Computing Machinery chapter (2003-2004).