

# Joshua B. Thorp

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Flexible programmer and creative problem solver adept as project lead. Extensive experience modeling complex adaptive systems, human behavior in organizations, distributed systems design, machine vision applications, and designing scientific visualizations. Strong collaborative skills working closely with colleagues and consulting with a broad range of clientele.

## SKILLS

**Programming Languages:** Java, C/C++, Perl, Python, Postscript, LISP, Netlogo, Matlab, Javascript, HTML, XML, MySQL.

**Software: Libraries:** JDBC, Repast, GDAL, Shapelib, processing.org; **Development**

**Environments:** Eclipse, Netbeans, JProbe suite, JTest, TogetherJ UML roundtrip, Linux/GNU suite of tools including gcc, gdb, make, vi; **Version Control:** cvs, svn, Perforce; **Graphics:** Blender, Photoshop; **Web Software:** Apache Web Server, Google Earth, Django Python web application framework, AJAX.

**Software/Hardware development:** Built an innovative multi-touch table and created software to control applications that provide human tactile/visual relationships providing active engagement with the computer modeled environment and agents.

## EXPERIENCE

**Redfish Group, Santa Fe, NM**

2005 to 2007

**Software Developer, Principal**

Created an original **agent based data viewer** of children passing through the Florida Mental health services. Work included spring layout graphs derived from cluster analysis and dendrogram analysis of 'state transition data'. The project allowed for multiple approaches to visualizing state transition data compiled originally for the derivation of a Markov model.

Produced a series of **kml/kmz image overlays on Google Earth** that demonstrated the extent of flooding for coastal cities of the US given a particular level of sea rise. Python and Python GIS libraries were used extensively to create a command line application applied in a batch process against a series of coastal cities. This project included data in multiple GIS formats.

Managed the production of a **research video web application** built in the Django web application framework using the Prototype AJAX library for editing research notes and searching for videos while viewing a Flash video on the same page.

Created an agent based model of **crowd evacuation** under several situations and scenarios, such as the evacuation of baseball stadium and a subway station, in the Processing Java framework. The Blender 3D graphic modeling application was used to render movies of the resulting egress model runs of the resultant agent paths within a network topology of the stadium.

Produced a **novel visualization** of engineering data for Intel Corporation. The visualization consisted of three different classes of entities, each constrained to a particular 3D space and connected to each other by springs resulting from relationships generated from the database.

Modeled **automobile traffic evacuation** for neighborhoods of Santa Fe in the event of a wildfire. The model was implemented in Python utilizing GIS street and housing data from the city, fire model runs from a separate fire model named Farsite, and USGS elevation data. The model was animated in the Blender 3D environment.

**Independent Contractor/Consultant Saint Louis, MO** 2002 to 2005  
Worked with an ethnographer at the Washington University School of Medicine to model a **heroin street market** in Denver CO. The initial work was performed in the Netlogo agent based modeling environment but was re-implemented in the Processing Java framework as more sophisticated modeling experiments were required based on the ethnographic study.

Created a Java Swing based **graph viewer of social network structure** in the Los Alamos Agent-Based Operational Risk Simulation (LABORS) project. These social network graph structures were built into the simulation from a MySQL database using the JDBC library and implemented in the Repast Java modeling environment.

Developed a **Java Swing GUI** for the Los Alamos Multi-Agent Simulation (LAMAS). Created an editor for general model parameters in multiple XML files. Parameter validation was explored as well as multiple view/edit modes. Transitioned these XML files along with the creation of new data inputs into a MySQL database using JDBC to communicate with a Repast model.

Built agent based model analyzing the value of a CEO making decisions in a **NK model of business landscape** in consultation with an Olin Business School Researcher at Washington University in Saint Louis. Data output was suitable for analysis in Microsoft Excel.

**BiosGroup Inc. Santa Fe, NM** 2000 to 2002  
**Software Engineer**

Performed as technical lead on **research and development of a self-administrating, self-organizing file storage system** for a major file storage company. Technologies explored include peer-to-peer file sharing, network simulation, and distributed resource allocation.

Interviewed domain experts at a major Canadian bank to acquire the needed business process/social interactions to design a **model of the Risk and Account Managers**.

Developed an agent based model of a major energy company for **Market and Business Risk Model**. Responsibilities included interviewing domain experts, development of model of the Exploration and Development business unit in concert with domain experts within the energy company, and supported researchers in the analysis of the model.

Facilitated project review and transition of code base from projects to code repository and served as internal quality assurance consultant to project teams. Projects included a **Supply Chain Model** and general **Agent Based Modeling components**.

## EDUCATION

2007 *Complex Systems Summer School, Santa Fe Institute, Santa Fe NM*

*College of Engineering, Cornell University, Ithaca NY*

1999 *Bachelor of Science*

Major: Computer Science with a strong concentration in Mathematics.

## VOLUNTEER

**New Mexico Supercomputing Challenge**: Instructor, Projects Expo Judge 2005-2007/08

**Santa Fe Institute Growing Up Thinking Scientifically (GUTS) Program** - Volunteer 2007

**New Mexico Museum of Indians Art and Culture** – Educational Events Volunteer 2007