

## Summary

I am a versatile software engineer with over 20 years of experience developing complex object-oriented programs based on platforms ranging from desktop, client/server, web apps, to RESTful APIs. I have coded in many languages, focusing on Python for the last three years. I've done plenty of database work in SQL, and I've explored cluster solutions like Hadoop Impala, GraphX, and Vertica to speed up machine learning algorithms. I've designed and built a host of systems including compilers, GUIs, tutoring systems, simulators, and authoring tools, and I led a team (and programmed) a comprehensive Java AI system comprised of a new graphical query language (editor, planner, execution engine), an innovative database, and rich desktop browsers and visualizations. I specialize in agile development, having coached dozens of developers in Extreme Programming.

## Experience

### Principal Software Engineer & Consultant (Amherst, MA) 2015 - present

- Taking on contracting projects in Python, including applications, web apps, databases, tools, and APIs in all types of organizations. **Projects:** Improved performance and robustness of an information extraction pipeline (Node.js, Scala), led a successful deliverable for a key project, evaluated performance on 1000s of documents (grid engine), and prototyped a web-based SVG annotation tool (Play Framework, Java). Wrote PeepWeather.com, a small production app for daily forecasts (HTML, CSS, JavaScript, Bootstrap, jQuery, REST/XML, Python Flask, Git, Heroku).

### Research Fellow, Senior Research Software Engineer Knowledge Discovery Laboratory, School of Computer Science, UMass Amherst 2011 - 2015

- Co-designed and coded new causal learning framework (Python). Coached grad students in Extreme Programming methods (TDD and refactoring). Led high-level exploration of architecture and infrastructure supporting big data era of machine learning. Experimented with features and performance of MPP platforms, including single-node SQL (Postgres), Hadoop, distributed SQL (Impala, Vertica), graph databases (Neo4J, Giraph), and cluster computing (Spark).

### Founder | Think, Try, Learn (Amherst, MA) 2007 - 2010

- Led a small team that created a new social platform ("Edison, the Think, Try, Learn Experimenter's Journal") based on a philosophy we discovered for treating life as a personal scientific experiment. Managed all entrepreneurial levels, including development, user experience, evangelism, and marketing (700+ users). Concepts published in the Wiley book *Mindhacker* (2011).

### Senior Research Software Engineer Knowledge Discovery Laboratory, CS Department, UMass Amherst 1999 - 2007

- Designed and implemented major portions of an end-to-end experimental machine learning platform, including sophisticated editors, visualization tools, scripting, and the compiler for a new graphical programming language. Overhauled lab software development by instituting development best practices, including coding standards, continuous integration, source control, and nightly builds. Mentored students and staff in Extreme Programming techniques, oversaw lab programmers and consultants, and was technical liaison to other labs, industrial partners, and DARPA.

## Senior Software Engineer

Center for Knowledge Communication, CS Department, UMass Amherst

1997 - 1999

- Built a variety of educational systems including a client/server tutor used by hundreds of undergraduates to learn chemistry via an atomic structure editor that was integrated with a knowledge-based back end. Created 30+ award-winning interactive applets for discovery-based teaching of science concepts. Wrote proof-of-concept tutoring system to teach integrated circuit “chip shooter” concepts and operation.

## Software Engineer/Consultant (Amherst, MA)

1994 - 1997

- Implemented a wide range of projects for various companies including Apple Computer. Examples include design and implementation of a large intelligent tutor platform and content authoring tools (knowledge representation, graphical programming environment, and a Java-based compiler and player) and commercial interactive computer-based training applications for customers such as NYNEX and Bell Atlantic.

## Systems Engineer and Programmer

National Aeronautics and Space Administration, Kennedy Space Center, FL

1984 - 1989

- Performed operational and later R&D roles to support early NASA Space Shuttle missions. Developed a real-time telemetry analysis project to assist test, checkout, and in-flight monitoring of Shuttle experiments. Programmed an expert system shell for process control, monitor, diagnosis, and repair of ground systems. Pinpointed and solved booster electrical system problems during test, checkout, and launch. Received Employee Suggestion Program Award for money-saving Solid Rocket Booster processing improvements.

## Education

Master of Science, Computer Science, University of Massachusetts, Amherst

1991

Project: “Using ‘Live Information’ in a Multimedia Framework.”

Bachelor of Science, Electrical Engineering, Bradley University

1984

Magna Cum Laude

## Recommendations

Please see my profile at <http://linkedin.com/in/matthewcornell> .