



Alex Towell

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Alex Towell

Computer Science, Data Science, and Mathematics

About Me As a versatile computer scientist and mathematician, I blend theoretical knowledge with practical skills across a wide range of technologies. My expertise spans artificial intelligence, data science, and information security, complemented by extensive experience in full-stack development. I've honed my skills in both front-end and back-end technologies, as well as API and library development, as evidenced by my numerous GitHub repositories. Driven by curiosity and a passion for continuous learning, I strive to create innovative solutions that bridge complex theories with real-world applications. My academic background and hands-on experience have equipped me to approach problems creatively, develop robust software systems, and effectively communicate technical concepts. I am committed to leveraging my diverse skill set to drive innovation and contribute meaningfully to the ever-evolving tech landscape.

Education

2021 - 2023, Southern Illinois University-Edwardsville

MS in Mathematics

- GPA: 3.9/4.0
- Concentration: Statistics and Operations Research
- Award: The R.N. Pendergrass Graduate Student Scholarship

2012 - 2015, Southern Illinois University-Edwardsville

MS in Computer Science

- GPA: 4.0/4.0
- Concentration: Artificial Intelligence
- Award: Outstanding Graduate Student, SIUE School of Engineering's 7th Annual Awards Banquet

2006 - 2010, Southern Illinois University-Edwardsville

BS in Computer Science

- GPA: 3.6/4.0
- Award: Outstanding Junior in the Department of Computer Science

Skills

- ML/AI
- Information Retrieval
- Statistics and Data Analysis
- Operations Research and Optimization
- Cryptography
- Technical Writing
- Programming: Python, R, C++, Shell Scripting, LISP, Prolog
- Programming Language Design: Domain-Specific Language and API Design
- Foundation Models: Fine-Tuning, LLM Programming, Tool Integrations
- Data Structures and Algorithms
- Encrypted Search
- Mathematical Modeling
- Homomorphic Encryption
- Probability/Information Theory
- Web Design



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Publications

- “Reliability Estimation in Series Systems: Maximum Likelihood Techniques for Right-Censored and Masked Failure Data,” Southern Illinois University-Edwardsville Department of Mathematics and Statistics, Masters Project, Oct 2023
- “Estimating how confidential encrypted searches are using moving average bootstrap method,” IEEE Cloudcom, Dec 2016
- “Encrypted search: enabling standard information retrieval techniques using new secure index types while preserving confidentiality against an adversary with access to hidden query histories and contents of secure indexes,” ProQuest Dissertations & Theses, Aug 2015

Relevant Work Experience

Research Assistantships, General Assistantships, and Teaching Assistantships (Jan 2011 – May 2013 and Jan 2021 – Dec 2021)

- **Research Assistant:** Conducted research combining cellular automata and agent-based models for economic simulations; applied RL techniques to learn efficient gait patterns for hexapod robots.
- **General Assistant:** Setup and maintained a Hadoop cluster for simulations; implemented algorithms related to graph clustering.
- **Teaching Assistant:** Graded coursework, provided office hours, tutoring, and lab instruction (e.g., instructed STAT 380 lab).

Interests

- Open source software development, research, and documentation. See github.com/queelius/.
- Blogging: Sharing ideas and highlighting current projects. See metafunctor.com
- Fitness and health: Maintaining health and strength through running and rowing.
- Computer hardware: Building and maintaining custom servers and virtualization solutions (e.g., Proxmox).