

Leader, learner, teacher. **Developer** of software, knowledge, and people. **AI/machine learning** scientist/engineer. Cloud native distributed systems engineer. Senior Scala, Java, **Python**; mid **C++17**; junior **Go** programmer.

Work Experience

Senior AI and Software Engineering Lead IBM, The Weather Company Aug 2019 to present

- Lead a team writing globe-scale core microservices that are involved in every API call to our business, on IBM Cloud and AWS (Scala, **Go**, **Kubernetes**, etc.).
- Mentored junior, mid and senior engineers into productive **Python** developers.
- Recruited to small senior team writing **big data** ETL pipelines in **Apache Spark** to support California Consumer Privacy Act compliance. Recognized company-wide for delivering solution in three months.
- Sped up a data cleanup and migration process from over 15 hours to under 1 hour, enabling switchover of two core back-end services from AWS to IBM Cloud with minimal down time.
- Wrote anti-corruption layer for microservices failing due to bad inputs that exploded Cassandra 10x. With cleanup and migration process, my design fixed the problem and prevented it from ever recurring.

Independent Consultant MIT Press Feb 2016 to present

Review **machine learning** textbooks, recommend publication, provide editorial suggestions.

Lecturer of Computing Georgia Institute of Technology May 2013 to Aug 2019

Taught over 1000 students a year. Led a staff of 40 teaching assistants, including several top award-winning students; most now work at top tech companies. **Co-directed study abroad program in Berlin, Germany**. Developed and taught courses in **Machine Learning**, Databases, Computational Tools for Data Analytics, Object-Oriented Design and Software Engineering, Object-Oriented Programming, and Python workshops for MS in Analytics, MS in Quantitative and Computational Finance.

Software Engineer Travel Syndication Technology Dec 2015 to Aug 2016

Wrote back-end Scala code for a suite of online travel applications built from hundreds of thousands of lines of Scala and millions of lines of Java, HTML, and JavaScript.

Adjunct Professor Southern Polytechnic State University Jan 2011 to Dec 2011

CS 3123 Programming Language Concepts, CS 3696 Application Programming in Scala.

Research Scientist Georgia Tech Research Institute Nov 2001 to Apr 2013

- **Principal investigator**: intelligent non-player characters for interactive narratives and games. Wrote AFABL, a **Scala**-embedded domain specific language for writing intelligent agents. **First runner-up, GTRI independent research of the year**.
- **Chief architect** for 12 software engineers and **leader** of 5-member core sub-team. Modernized software development of broader team by restructuring sub-teams, **creating and supporting shared libraries**, redesigning software systems, and unifying development processes. Changes improved software quality and delivery schedules, reduced costs, and allowed creation of team of student cooperative Computer Science majors to act as junior software engineers. Two of my former reports are now senior principal software engineering leads at Microsoft and Amazon, one is a PhD Principal Member of Technical Staff at Sandia National Labs.
- Led 3-member team that successfully applied information-theoretic **machine learning optimization** algorithm to an antenna design problem that had confounded existing genetic algorithm-based system.
- Investigated **neural network** architectures for radio emitter identification.
- Co-founded Cognitive Computing Lab with Prof Ashwin Ram (now Technical Director of AI, Google).
- Working with econometrician investigating patterns of specialization in Physics research, wrote **Python NLTK** and **Numpy text mining** analysis and presentation apps. Published in journal Scientometrics.
- Developed an electronic warfare data management system with novel data representations, algorithms, and user interfaces (**Java**, **JSP**, **HTML**, **Tomcat**) that won a \$2M follow-on project.

Software Engineer Internet Security Systems (Now IBM) Aug 2000 to Nov 2001

Rated in top 5% of software engineers. Key player in two **eXtreme Programming** projects using **Java** servlets, **RMI**, and **JDBC**. One of two lead software engineers on UI/application server team, developed major parts the design, established build procedures, and mentored other developers. Received formal award for contributions to the usability and design of the product. Chosen from the 12 engineers on first team for important core position on company's most important forward-looking project.

Software Engineer, IT Manager USAF, Columbus AFB, MS May 1998 to Aug 2000

Conceived, championed, designed and built flight management system at heart of two squadrons flying up to 200 flights daily. Four front-end applications in Borland **C++ Builder**, Interbase RDBMS server, and application logic in **C++**. Saved 8000 person-hours per year, improved command and control 100%.

T-37 Instructor Pilot USAF, Columbus AFB, MS Jul 1997 to Jun 2000

Turned new Air Force officers into military jet pilots in USAF Primary Jet Pilot Training. Taught fundamentals, aerobatics, instrument flight in poor weather, and formation flying. Flew daily missions with young students in a dynamic, high stress flying environment regularly making critical real-time decisions and using expert judgment to achieve the best training and flight safety.

KC-135 Pilot USAF, McConnell AFB, Wichita, KS Aug 1995 to Mar 1997

Executed hundreds of successful missions in worldwide military operations. Outstanding crew award during operation Southern Watch in Saudi Arabia. Highest co-pilot position in squadron (Stan/Eval). One of only two co-pilots in squadron selected for coveted special operations qualification.

Space Training Instructor Lowry AF, and Vandenberg AFB Jun 1992 to Mar 1995

Taught mechanics to students training to become space operations officers. Every class rated me as their best instructor. Achieved highest pass rate in all of UST while teaching its most difficult course.

Education

Ph.D. 2017 **Georgia Institute of Technology** *Computer Science*

Advisor: Charles L. Isbell, ACM and AAAI Fellow, now dean of Georgia Tech College of Computing
Specialization: Intelligent Systems/Machine Learning

M.S. 2004 Southern Polytechnic State University *Computer Science*

B.S. 1990 United States Air Force Academy *General Engineering Curriculum*

Selected Publications

- [1] Christopher Simpkins and Charles L. Isbell. Composable modular reinforcement learning. In *Proceedings of the 33rd National Conference on Artificial Intelligence (AAAI)*, Honolulu, HI, February 2019.
- [2] Christopher Simpkins, Spencer Rugaber, and Charles L. Isbell. Dsl design for reinforcement learning agents. In *Workshop on Domain-Specific Language Design and Implementation*, October 2017.
- [3] Christopher Simpkins. Integrating reinforcement learning into a programming language. In *Proceedings of the 2010 SIGART/AAAI Doctoral Consortium*, Atlanta, GA, July 2010.
- [4] Chiara Franzoni, Christopher Simpkins, Li Baoli, and Ashwin Ram. Using content analysis to investigate the research paths chosen by scientists over time. *Scientometrics*, 83(1):321–335, April 2010.
- [5] Christopher Simpkins, Sooraj Bhat, and Charles Isbell. Towards adaptive programming: Integrating reinforcement learning into a programming language. In *OOPSLA '08: ACM SIGPLAN Conference on Object-Oriented Programming, Systems, Languages, and Applications, Onward! Track*, Nashville, TN USA, October 2008.

Other

- Volunteer: **Black Girls Code**; **P-TECH**, Carver HS, Atlanta; IBM Veterans mentor, coach.
- **GTRI Project Director Certificate**, 2010 consisting of nine professional development courses.
- **GTRI Mentor/Mentee Program**, 2003 for high-performers identified as future leaders.
- **PADI Master Scuba Diver Trainer** and DAN first aid instructor. See <http://prost.us/>.
- Fluent in **German** (Goethe C1 01652-GZ-C1-18-86) and **French** (DELFB2 033054-002105).