

# Christopher Simpkins

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## Summary

**Leader**, computer scientist, **software engineer**, and teacher. Passionate developer of software, knowledge, and people. **Researcher** in **AI**, **machine learning**, software engineering, programming languages and **natural language processing (NLP)**. Builder of production software systems. Fluent in **German** (Goethe-Zertifikat C1 Number 01652-GZ-C1-18-86) and **French** (DELF B2 Number 033054-002105).

## Education

<b>Ph.D.</b>	2017	Georgia Institute of Technology	<i>Computer Science</i>
<b>M.S.</b>	2004	Southern Polytechnic State University	<i>Computer Science</i>
<b>B.S.</b>	1990	United States Air Force Academy	<i>General Engineering Curriculum</i>

## Work Experience

**Lecturer:** Georgia Institute of Technology, College of Computing, May 2013 to present

Teach over 1000 students each year, lead a staff of 40 teaching assistants. Developed and taught:

- [CS 4641](#) - Machine Learning (Supervised and unsupervised learning, reinforcement learning)
- CS 4911 - Senior Design Capstone (Scrum, team-based software engineering)
- [CS 4400](#) - Databases (ER modeling, relational algebra and calculus, SQL, file and index structures)
- [CS 2803](#) - Comp Foundations for Data Analytics (Python, Scala, SQL, Scipy, Hadoop, Spark)
- [CS 2340](#) - Objects and Design (object-functional design in Java and Scala)
- [CS 2316](#) - Data Manipulation for Engineers (Python, SQL, Web Mining, Numpy, Pandas, Matplotlib)
- [CS 1331](#) - Introduction to Object-Oriented Programming (Java, OOP)

**Software Engineering Consultant:** Travel Syndication Technology, December 2015 to August 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. Technologies included **Scala**, **Akka**, **Play! Framework**, **MySQL**, Hibernate, MongoDB, ReactiveMongo, HTML, JavaScript.

**Adjunct Professor:** Southern Polytechnic State University, January 2011 to December 2011

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

**Research Scientist (Principal Investigator), Software Engineer:** Georgia Tech Research Institute (GTRI) and College of Computing (CoC), Atlanta, GA, November 2001 to April 2013

- Revolutionized the software engineering processes of GTRI/STL by restructuring software teams, creating common code libraries, redesigning existing software systems (**Linux**, **Solaris**, **Oracle**, **Java**, **Tomcat**, **Struts**), and unifying development processes across projects. My changes improved software quality and delivery schedules, reduced costs, and facilitated my creation of a highly productive and cost-effective team of cooperative student software engineers.
- Applied MIMIC **machine-learning optimization** algorithm to an antenna design problem that had confounded existing genetic algorithm-based system (originally in **Lisp**, re-wrote in **Scala**).
- Applied **text mining** to a database of publication abstracts and biographical information for members of the American Physical Society to find patterns of specialization over time.
- 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), Atlanta, GA, August 2000 to November 2001

Rated in the 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 portions of 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 Air Force Base, MS, May 1998 to August 2000

Performed requirements analysis, design, evaluated options, and implemented two enterprise systems. Convinced commanders to devote scarce resources to my solutions, which became overwhelming successes. Designed and built mission critical flight management system which is heart of operations for two squadrons flying up to 200 flights per day. System has four front-end applications written with Borland C++ Builder using VCL components, an Interbase RDBMS server, and application logic in C++ using the **Standard Template Library**. Saved over 8000 person-hours per year and improved command and control by 100%.

**T-37 Instructor Pilot:** USAF, Columbus AFB, MS, July 1997 to June 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 judgement to achieve the best training and flight safety.

**KC-135 Pilot:** USAF, McConnell AFB, Wichita, KS, August 1995 - March 1997

Working with a highly skilled crew, executed hundreds of successful missions in worldwide military operations. Received outstanding crew award while deployed in support of operation Southern Watch in Saudi Arabia. Achieved highest co-pilot position in squadron (Stan/Eval). One of only two co-pilots in squadron selected for highly coveted special operations qualification.

**US Undergraduate Space Training (UST) Instructor and Software Engineer:** Lowry AFB, Denver, CO and Vandenberg AFB, Lompoc, CA, June 1992 - March 1995

Taught mechanics to students preparing for assignments as space operations officers. Every class I taught cited me as their best instructor. Achieved highest pass rate in all of UST while teaching its most difficult course. Developed in-house software in C for office and training applications.

### Selected Publications

- [1] Christopher Simpkins and Charles L. Isbell. Composable Modular Reinforcement Learning. In *Proceedings of the Thirty-Third 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 (DSLDI)*, 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] Christopher Simpkins, Charles L. Isbell, and Nicholas Marquez. Deriving behavior from personality: A reinforcement learning approach. In *10th International Conference on Cognitive Modeling*, pages 229–234, Philadelphia, PA, 2010.
- [5] 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.
- [6] 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

- PADI **Master Scuba Diver Trainer** and Emergency First Response Instructor # 347984 (PADI Pro Check: <https://apps.padi.com/scuba-diving/pro-chek/>)
- SSI Divemaster Instructor # 72876 (inactive as of January 2018)
- DAN DEMP (Diving Emergency Management Provider) and DFA Pro (Diving First Aid for Professional Divers) Instructor # 15550 (inactive as of November 2018)
- President and Organizer, Pro Scuba Training, LLC <http://prost.us/>