C. Carlo Fazioli

Curriculum Vitae

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I am a research scientist and software engineering generalist with experience in cloud computing and artificial intelligence. I am a lifelong learner confident in my ability to rapidly cultivate new knowledge, as well as drill down into concept details.

Current Position

2018 – Present **Software Engineer**, *Group W, Inc.*, Vienna VA.

Main contributor on a MORS Barchi-prize-winning, multi-year, multi-million dollar DARPA contract to develop an AI wargaming application. Project responsibilities include:

○ Architecting microservices with Kubernetes/Docker on a private 11-node 1,240 CPU cluster, as well as a full installation on Microsoft Azure
○ Designing AI algorithms with NNs, MCTS, and RL
○ Developing application source code with python, bash, Django, GNU Make
○ Constructing application API to support front end Vue devs
○ Managing GitLab issues, branches, merges, releases, and testing and deployment pipelines
○ Administrating MongoDB at the mongo shell and with pymongo

General corporate responsibilities include:

○ Reviewing academic research literature
○ Managing interns
○ Contributing to contract proposal BD
○ Briefing industry stakeholders

Education

2006 – 2009 **Ph.D. Mathematics**, *University of Illinois at Chicago*, Chicago IL.
2005 – 2006 **M.S. Mathematics**, *University of Illinois at Chicago*, Chicago IL.
2000 – 2004 **B.S. Mathematics**, *University of San Francisco*, San Francisco CA.

Previous Positions

2016 – 2018 **Econometric Modeler**, *International Monetary Fund*, Washington DC.

Collaborated with IMF economists on economic model development; researched, designed, and implemented algorithms for use by IMF staff; pursued exploratory research into technology solutions for IMF institutional needs; addressed technical needs of individual IMF staff.

○ Researched Monto Carlo techniques to approximate game- theoretical quantities, resulting in substantial runtime improvements
○ Authored user software to assist economists in global systemic risk valuations
○ Developed working knowledge of AWS, including IAM, VPC, EC2, and SE, for internal pilot program

2013 – 2016 **Assistant Teaching Professor**, *Dept. of Mathematics*, Drexel University, Philadelphia, PA.

Developed course and lab materials; lectured, graded exams, monitored students' use of online resources, assigned final grades; assisted students as needed outside of class or in office hours; directed teaching assistants.

○ Complex Variables and Vector Analysis (Spring 2014)
○ Differential Equations (Winter 2014, Spring 2015, Winter 2016)
○ Linear Algebra (Fall 2013, Winter 2014, Winter 2015, Spring 2016)
○ Discrete Math (Summer 2014)
○ Multivariable Calculus, Calculus II, Precalculus, Math 101 (multiple quarters)

2011 – 2013 **Postdoctoral Research Associate**, *Dept. of Mathematical Sciences*, New Jersey Inst. of Tech., Newark, NJ.

Researched, designed, and coded novel algorithms for use in fluid dynamics simulations; briefed research supervisor; presented findings to collaborators and conference attendees.
○ Surveyed recent research literature
○ Communicated and collaborated with supervisors to develop research program
○ Drafted, wrote, revised, and debugged new numerical algorithms

2011 – 2012 **Lecturer**, *DMS*, NJIT, Newark, NJ.

Worked with course coordinators to develop course materials; lectured courses, graded exams, monitored students' use of online resources; assisted students as needed outside of class or in office hours.
○ Differential Equations (Fall 2011)
○ Honors Multivariable Calculus (Spring 2012)

2009 – 2011 **Lecturer**, *Dept. of Math, Stats, and Comp. Sci.*, UIC, Chicago, IL.

Worked with course coordinators to develop course materials; lectured courses, graded exams, monitored students' use of online resources; assisted students as needed outside of class or in office hours. Directed teaching assistants in designing and administering discussion sections and quizzes.
○ Linear Algebra course coordinator (Spring 2011)
○ Linear Algebra (Fall 2010, Spring 2010, Fall 2009)
○ Differential Equations (Spring 2011)
○ Multivariable Calculus (Fall 2010, Fall 2009)

2007 – 2009 **Graduate Student Lecturer**, *MSCS*, UIC, Chicago, IL.

Lectured courses; wrote and graded exams; assissted students as needed during office hours and scheduled meetings; assigned final grades.
○ Linear Algebra (Spring 2008)
○ Multivariable Calculus (Spring 2009, Fall 2007)

2005 – 2009 **Teaching Assistant**, *MSCS*, UIC, Chicago, IL.

Led discussion sections; created and graded quizzes; assisted students as needed in office hours and department tutoring center.
○ Linear Algebra (Summer 2007)
○ Differential Equations (Summer 2006)
○ Calculus II (Fall 2008, Summer 2008, Spring 2005)
○ Calculus I (Spring 2008, Spring 2007, Fall 2006, Spring 2006, Fall 2005)
○ Calculus I Emerging Scholars Program (Spring 2007, Fall 2006)

2002 **Supplemental Instruction Tutor**, *Dept. of Mathematics*, USF, San Francisco, CA.

Attended lectures and took notes for undergraduate courses; hosted drop-in peer tutoring sessions.
○ Calculus I (Spring 2002)
○ Introduction to Statistics (Fall 2002)

Publications

M. Booty, C. Fazioli, M. Siegel. "A New Algorithm for Efficient Computation of Moving Fluid Interfaces." (in progress)

C. Fazioli, D. Nicholls. "Stable Computations of Variations of Dirichlet-Neumann Operators." *Journal of Computational Physics*, Volume 229, Number 3, 906-920 (2010)

C. Fazioli, D. Nicholls. "Parametric Analyticity of Functional Variations of Dirichlet-Neumann Operators." *Differential and Integral Equations*, Volume 21, Number 5-6, 541-574 (2008)

Invited Talks

2014	*Overlapping Patches for Dynamic Surface Problems*, Conference on Hamiltonian PDE, The Fields Institute for Research in Mathematical Sciences, University of Toronto, Toronto, Ontario, Canada
2012	*Overlapping Patches for Dynamic Surface Problems*, Applied Math Seminar, Department of Mathematics, Drexel University, Philadelphia PA
2009	*Functional Variations of the Dirichlet-Neumann Operator*, IMACS Conference, University of Georgia, Athens GA
2009	*Functional Variations of the Dirichlet-Neumann Operator*, AMS Sectionals Meeting, University of Illinois at Urbana-Champaign, Urbana-Champaign IL

Conferences Attended

2014	Joint Mathematics Meetings, Baltimore, MD
2014	Conference on Hamiltonian PDE, Toronto, Ontario, Canada
2012	Frontiers in Applied and Computational Mathematics, NJIT, Newark, NJ
2011	Joint Mathematics Meetings, New Orleans, LA
2009	IMACS Conference, University of Georgia, Athens, GA
2009	AMS Sectionals Meeting, University of Illinois at Urbana-Champaign, Urbana-Champaign, IL
2009	Joint Mathematics Meetings, Washington, DC
2005	3-Manifolds and Knot Theory Conference, University of Texas at Austin, Austin, TX
2005	Algebraic Geometry, Symplectic Geometry and Theoretical Physics: A Conference Celebrating the Contributions of Women Researchers, Philadelpha, PA

Service

Summer 2015	Students Tackling Advanced Research (STAR) Faculty Mentor, Drexel University, Philadelphia, PA
2014 – 2015	Teaching Innovations Committee Head, Drexel University, Philadelphia, PA
2008 – 2009	Faculty Partner, UIC, Chicago IL
Spring 2005	Associate Organizer, Bay Area Math Meet, USF, San Francisco, CA
Spring 2004	Student Volunteer, BAMM, USF, San Francisco, CA

Hobbies and Interests

- Solving the NYT crossword puzzle daily
- Running, cycling, and yoga
- Cloud computing
- Science fiction lit/TV/movies
- Advent of Code and CTFs
- Bug bountying and cybersecurity