Francesco Di Natale

1534 Portola Ave ✦ Livermore, CA 94551
(727) 642-1705 ✦ Email LinkedIn ORCiD

Education:

Master of Science in Computer Science, University of Colorado at Boulder — Dec 2013
Overall GPA 3.612/4.0

Bachelor of Science in Computer Science, University of South Florida — May 2010
Bachelor of Science in Computer Engineering, University of South Florida — May 2010
Overall GPA 3.97/4.0

International Baccalaureate Diploma, Palm Harbor University High School — May 2006

Skills:

Operating Systems:	Unix/Linux (Ubuntu, MacOSX), Windows 7/8/10
Languages:	Python, C/C++, Ruby, Shell, Bash, C# (w/ .NET), Java
Other:	git, SLURM, SQL, Agile/Scrum Methods, Atlassian Tools (BitBucket, Confluence, JIRA)

Domain Knowledge and Interests:

Interests: Software Engineering, Python, Agile/Scrum Development Methods, Software System Design, Object Oriented Design, Algorithms, Simulation, Workflow automation and tools, HPC, Computer Architecture

Experience:

Lawrence Livermore National Laboratory, Livermore, CA – Project Lead — *June 2016 to present*

Member of the Application, Simulation and Quality directorate tasked with collecting requirements, discussing features, and developing a workflow for managing campaigns of simulations. Currently supporting computational biologists providing general software engineering expertise and implementing workflow features in Python for the team's multi-scale molecular dynamics simulations. Other tasks include debugging the workflow on HPC clusters and guiding the team on best software practices. Also actively maintaining the Maestro Workflow Conductor Python package and adding functionality based on the team's use cases.

Titan Bear Gaming, Los Angeles, CA – Co-owner — *November 2017 to present*

An online hobby board game store started with a good friend. Initially began as an effort to spread the joy of board games and offer services to support the community. We believe that you should have more fun -- it's good for you!

Intel Corporation, Inc., Santa Clara, CA – Performance Architect — *February 2014 to May 2016*

Member of the Power and Performance team modeling and assessing future products by generating data for comparison with prior generations. Responsible for being the bridge between multiple teams to collect model components, integrating new sub-models, validating generated data, and reporting component bugs/inaccuracies each quarter for multiple product variations and product lines. Data produced would be used to make milestone and project milestone adjustments. Also responsible for helping maintain a cycle accurate C++ processor simulator, running performance studies, adding simulator features, and debugging processor performance issues. Successfully identified and debugged a key performance bug, ran various large scale sensitivity studies, and presented solutions to improve performance to meet expected targets.

University of Colorado, Boulder, CO - Graduate Teaching Assistant — *Sept 2011 to Dec 2013*

Part of a team of assistants that provided aid for/taught recitations, graded, and coordinating with students for completion of assignments. Courses assisted for: CSCI 4308 – Software Engineering Project (Sept 2011-May 2012), CSCI 2400 – Computer Systems (Aug 2013-Dec 2013), and CSCI 1300 – Introduction to Programming (C++, Python) (Sept 2012-May 2013).

Intel Corporation, Inc., Santa Clara, CA - Graduate Server Performance Intern — *May 2013 to August 2013*

Worked with the Server Performance Team running architecture studies to test cache performance for upcoming architectural features and releases. Became familiar with MESI/MESIF cache protocols and gained experience adding to a large C++ simulation infrastructure. Using features added to the team's simulator, performance studies were run to assess the benefits of different caching schemes.

Intel Corporation, Inc., Santa Clara, CA - Graduate Server Performance Intern — *May 2012 to August 2012*

As part of the Server Performance Team running architecture studies to test performance for upcoming architectural features and releases. In performing studies, became familiar with large scale simulation infrastructure and newer developments in Computer Architecture, as well as performed the first performance studies on a future Xeon architecture.

Nextech Systems, Inc., Tampa, FL - **Software Developer** *March 2010 to June 2011*

Developer in a twenty person team designing and implementing new functionality for the Nextech Practice software in Microsoft Visual C++. My responsibilities included adding new functionality, performing data conversions for new clients, setting up lab integrations, and handling advanced support incidents.

Publications ([Google Scholar](#))

Di Natale, F., Bhatia, H., Carpenter, T. S., Neale, C., Schumacher, S. K., Oppelstrup, T., … Ingólfsson, H. I. (2019). A Massively Parallel Infrastructure for Adaptive Multiscale Simulations: Modeling RAS Initiation Pathway for Cancer. Supercomputing '19: The International Conference for High Performance Computing. https://doi.org/10.1145/1122445.1122456 (**Awarded Best Paper**) [LINK](#).

Carpenter, T. S., López, C. A., Neale, C., Montour, C., Ingólfsson, H. I., **Di Natale, F.**, . . . Gnanakaran, S. (2018). Capturing Phase Behavior of Ternary Lipid Mixtures with a Refined Martini Coarse-Grained Force Field. Journal of Chemical Theory and Computation, 14(11), 6050-6062. doi:10.1021/acs.jctc.8b00496

Di Natale, F., Mercer, J. D. N. J., & Ray, D. (2010). A Computer Engineering Capstone Design Project: A Harvard Architecture Assembly Simulator. [LINK](#).

Presentations Associated with a Publication:

1. A Massively Parallel Infrastructure for Adaptive Multiscale Simulations: Modeling RAS Initiation Pathway for Cancer
    Supercomputing'19, Denver, CO (**Awarded Best Paper**) [LINK](#) November 2019

Invited Talks:

1. MuMMI: Massively Parallel Multiscale Simulation for Modeling RAS Protein and ML Workflow Challenges,
    DSI Workshop 2019, Livermore, CA [LINK](#) July 2019

Projects:

Maestro Workflow Conductor (Lawrence Livermore National Lab, August 2016 - Present)

Independently authored a Python package for specifying, launching, and managing large campaigns of simulations. The package is designed with the basic principles of reproducibility, repeatability, and documentation as top priorities. The package uses a custom YAML study specification for specifying dependencies, workflow steps, environment, and high performance scheduling. On the back-end, the tool is designed to leverage modularity wherever possible to make expansion of capabilities more maintainable -- modules range from reusable data structures, defined abstract interfaces for consistent object interactions, and adapters for interfacing with multiple scheduling services. The code has been open sourced and is located at https://github.com/LLNL/maestrowf

Study Launcher (Intel Corporation, May 2014)

As an independent grassroots effort, co-created and developed a Python tool to revamp the team's simulation launching infrastructure from Perl template scripts to a fully fledge tool capable of launching combinations of studies. The tool takes a user-friendly XML specification and produces a set of jobs to be executed by exponentiation of user-defined variables. Study Launcher is now the most widely used job launching tool, being used by 90+% of the team.

Wildlife Sensing Project (Fall 2011)

Worked on debugging and improving embedded system code for a system of wireless collars for tracking dear and other wildlife. The collars tracked the interaction of deer to attempt to better understand the interactions and the spread of disease.

Senior Design Project (Spring semester 2010)

As a part of a team of four students, designed an instruction set architecture and simulator for the 2010 IEEE Computer Society Design Competition. The competition required that Software Engineering principle be followed, documentation, and a running simulator be submitted. The project was presented at the 2010 Capstone Conference in Boulder, Colorado and published in the conference proceedings.

Networks Project (Fall semester 2009)

Working with a partner, the project was to design server and client programs around a standard that was created by the class in a standards meeting about a better version of Twitter. Once the standard was developed, the programs were coded using C# and .NET sockets data structures, Windows forms, and threads.

Volunteering:

Sutherland Elementary School, Palm Harbor, FL – Volunteer Tutor (2004 to 2006)

   Volunteer tutor helping students struggling with math.

Sutherland Elementary School, Palm Harbor, FL – Volunteer Tech Assistant (2002 to 2004)

   Volunteered as a technology lab assistant helping to teach students the basics of computer usage.

Organizations and Leadership Roles:

Webmaster for University of Colorado at Boulder International (2013-2014)
Publicist for University of Colorado at Boulder International (2012-2013)
President of student branch of ACM (2009-2010)
Treasurer of Tau Beta Pi FL Gamma Chapter (2008-2009).

Honors and Awards:

LLNL Science & Technology Excellence in Publication Award (August 2020), **Best Paper (Supercomputing'19) LINK**, Multiple ASQ Division Awards (LLNL), Two Intel Team Awards, Member of Tau Beta Pi engineering honor society, awarded numerous scholarships on academic merit , awarded the Most Outstanding Graduate Award by USF's CSE Department.

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Di Natale, F., Bhatia, H., Carpenter, T. S., Neale, C., Schumacher, S. K., Oppelstrup, T., … Ingólfsson, H. I. (2019). A Massively Parallel Infrastructure for Adaptive Multiscale Simulations: Modeling RAS Initiation Pathway for Cancer. Supercomputing '19: The International Conference for High Performance Computing. https://doi.org/10.1145/1122445.1122456 (**Awarded Best Paper**) [LINK](#).

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Di Natale, F., Mercer, J. D. N. J., & Ray, D. (2010). A Computer Engineering Capstone Design Project: A Harvard Architecture Assembly Simulator. [LINK](#).

Presentations Associated with a Publication:

2. A Massively Parallel Infrastructure for Adaptive Multiscale Simulations: Modeling RAS Initiation Pathway for Cancer Supercomputing'19, Denver, CO (**Awarded Best Paper**) [LINK](#)   November 2019

Invited Talks:

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