Richard Boeri Decal

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Profile

Machine learning scientist with domain expertise in applying cloud computing and statistical modeling to engineering, scientific, and real-world problems. Work in team-contexts to create and modify scientific software libraries to process and understand noisy data generated by stochastic real-world processes. Able to seek input from outside experts to create domain-crossing solutions designed to scale.

Education

M.S. Data Science — Sarasota, FL
New College of Florida — Aug. 2017 — Dec. 2018

B.A., Chemistry/Biology (with honors) — Sarasota, FL
New College of Florida — Aug. 2007 — May 2011

Early admission in lieu of 4th year high school — Jupiter, FL
Harriet L. Wilkes Honors College — Sep. 2006 — May 2007

Expertise

$^+$ **denotes proficiency**

Languages Python$^+$ · R Tidyverse · Español$^+$ · English$^+$ · Italiano
Tools PyTorch, Keras, Tensorflow · (Geo)Pandas$^+$, MongoDB, PostgreSQL · Ray, PySpark, Hadoop · Plotly Dash, Flask · BeautifulSoup · Docker · Kedro, MLFlow

Computation

Operating Systems Proficient: MS Windows, Mac OS X, iOS, Linux, and Android.

Software Proficient: office suites, image manipulation and analysis software, and other common productivity packages. Novice: PyMol.

Programming Fluent: LaTeX. Proficient: Python.

Technical Skills

- Sci Python Stack
- ML Python Stack
- AWS EC2, S3
- Docker
- Git
- Data versioning
- Distributed computing: Ray Distributed, Spark

Photography I am a DSLR photographer and have proficiency with the Adobe suite (portfolio).

Other Fluent in English and Spanish. Known to dabble in the kitchen. I've played violin, piano, contrabass, and ukulele. Licensed scuba diver.

Industry Work

Lead Machine Learning Engineer Sarasota, FL
Dendra Systems Feb. 2020 — Now

Enabling whole-ecosystem restoration using deep learning.

Lead Data Scientist Sarasota, FL
PaceMate™ Feb. 2019 — Dec. 2019

Automated remote detection of cardiac arryhtmias in Internet-enabled heart implants using deep learning.

Academic Work

Modeling Hospital Patient Trajectories Sarasota, FL
Florence A. Rothman Institute Au. 2018 — Dec. 2018

Data-driven characterization of interactions between chronic conditions and heart failure using clustering and finite state modeling.

Automated Tracing of Neurons Seatle, WA
Peng Lab, Allen Institute for Brain Science June 2018 — Aug. 2018

Implemented proof-of-concept algorithm for automatically reconstructing brain cell morphologies from petabyte-scale microscope data using deep reinforcement learning.

Multisensory Integration in Mosquitos Seatle, WA
Fairhall Lab, University of Washington Oct. 2014 — May 2016

Developed agent-based dynamical models of mosquito thermal plume navigation behavior using wind-tunnel flight data.

Humpback Whale Migratory Census James Price Point, Australia
Kimberley Community Whale Research Project Aug. 2012 — Oct. 2012

Replicated a study at the proposed site of a gas processing port in Humpback calving waters. Our field research revealed gross inaccuracies in the oil conglomerate's report.

Endogenous Genetic Control Sarasota, FL
Walstrom Lab, New College of Florida Aug. 2010 — May 2011

Studied a genetic expression control pathway in *C. elegans*. My honors thesis project proposes a model for RNA Helicase A function in endogenous RNAi based on qRT-PCR evidence.

Role of Mitochondrial Fusion in Parkinson's Seattle, WA
Pallanck Lab, University of Washington May 2010 — Aug. 2010

Establish a method to grow, stain, and image primary dopaminergic neural cultures from *Drosophila* embryos. I tested whether Parkin and PINK1, proteins involved in Parkinson's disease, are recruited to depolarized mitochondria in dopaminergic neurons. This research was published in *PNAS*.

Functional Study of APC2 Protein Pittsburgh, PA
McCartney Lab, Carnegie Mellon University May 2009 — Aug. 2009

I determined that APC2, a protein with roles in colon cancer tumorogenesis, did not directly interact with β-catenin of the Wnt pathway's destruction complex. I disproved the theory that APC2's N-terminal domain was essential for its proper localization. This research was published in *Genetics*.

Organic Synthesis of P450-like Molecule Sarasota, FL
Scudder Lab, New College of Florida Sep. 2008 — Nov. 2009

Partial synthesis of a high-valent iron-stabilizing macrocycle based on the active site of cytochrome P450, with potential applications for cleaning industrial pollution.

Publications

Burman JL, Yu S, Poole AC, **Decal RB** and Pallanck LJ. "Analysis of neural subtypes reveals selective mitochondrial dysfunction in dopaminergic neurons from parkin mutants". *Proc Natl Acad Sci USA*. 2012 Jun 26;109(26):10438-43.

Kunttas-Tatli E, Zhou M, Zimmerman S, Molinar O, Zhouzheng F, Carter K, Kapur M, Cheatle A, **Decal RB**, McCartney BM. "Destruction Complex Function in the Wnt Signaling Pathway of Drosophila Requires Multiple Interactions Between Adenomatous Polyposis Coli 2 and Armadillo". *Genetics*. 2012 Mar; 190(3):1059-75.

Decal RB. "A Proposal for RNA Helicase A Function in Endogenous RNA Interference Pathways". Honors thesis, New College of Florida. May 2011.

Presentations

Decal RB, Burman JB, Pallanck L. "Is Parkin Recruited to Damaged Mitochondria in Dopaminergic Neurons?" SACNAS Conference. Anaheim, CA. September 2010. Poster.

Decal RB, McCartney BM. "APC2 Does Not Interact with in the β-Catenin Destruction Complex". Annual Sigma Xi Conference. The Woodlands, TX. November 2009. Poster.

Decal RB, McCartney BM. "APC2 Does Not Interact with in the β-Catenin Destruction Complex". ABRCMS Conference. Phoenix, AZ. November 2009. Poster.

Teaching & Outreach

Data Analysis Mentor, Intro to Programming Nanodegree. Udacity. 2017 — 2018

Brain Awareness Week 2015. University of Washington. March 2015

Upward Bound. University of Washington. July 2010

Awards, Grants & Honors

Full tuition waver for master's program
New College of Florida Aug. 2017 — Dec. 2018

NIH PA-12-149 Supplement Grant
University of Washington Jan. 2015 — Jan. 2016

Florida "First Generation" Scholar (two-time recipient)
New College of Florida Aug. 2009 — May 2011

Florida "Bright Futures" Scholar
New College of Florida Aug. 2007 — May 2011

Four Winds Silver Scholar
New College of Florida Aug. 2007 — May 2011

Student Research Grant
Dubois-Felsmann Research Endowment Nov. 2010

Student Travel Grant
Dubois-Felsmann Research Endowment Sep. 2009

ABRCMS Travel Award
American Society for Microbiology Aug. 2009

Honors Scholarship
Harriet L. Wilkes Honors College Sep. 2006 — May 2007

AP Scholar Award
J.P. Taravella High Apr. 2006