

# DAVID ORION GIRARDO

github.com/daig

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## EDUCATION

ASP Graduate Fellow	Massachusetts Institute of Technology	2015 - 2016
Math B.S. w/ Distinction	Worcester Polytechnic Institute	2010 - 2013
CS and Bioinformatics Minors		
Research Apprentice	University of Washington	Spring 2012

## WORK EXPERIENCE

<b>Head of Strategy (Co-founder) @ <i>New Science</i></b> - Building new institutions for basic biology research	Jun'21 - Present
<b>Software Engineer (Senior) @ <i>TripShot</i></b> - Designing and applying routing optimization algorithms (Haskell,Java)	Mar'21 - Apr'21
<b>Researcher (Independent Grants) in collaboration w/ <i>MIRI &amp; MIT</i></b> - Developed category-theoretic <b>foundations</b> for ML via a type system for <b>dynamical systems</b> (Agda).	Apr'19 - Feb'21
<b>Software Engineer @ <i>SimSpace</i></b> - Improved performance, stability, and featureset of Cyber Ranges infrastructure for security training exercises (Haskell, SQL, Typescript) - Developed company standard library (Haskell), design patterns, and documentation - Designed and implemented distributed VM health logging system.	Oct'17 - Dec'20
<b>Software Engineer (3rd) @ <i>Wrinkl</i></b> - Designed and built usage analytics database, integrated with reflex-dom/ghcjs app (Haskell, JS).	Jan'17 - Mar'17
<b>Software Engineer (3rd) @ <i>Leapyear Technologies</i></b> - Implemented improved privacy-preserving machine learning algorithms from literature (Haskell,Python) - Designed & developed in-memory database for 100gb-scale single-node private queries. (Haskell) - Collaborated with Tweag.io to deploy private database on Apache Spark using Hadoop HDFS (Haskell,Java)	Jul'16 - Jan'17
<b>Technical Staff (Associate) @ <i>MIT Lincoln Laboratory</i></b> - Project Lead for HSARPA Insider Threat classification - Simulated network flows by modeling network agents - Discovered characterization of Algebraic Ornaments (morphisms in <b>Poly</b> ) as functional lenses	Jan'15 - Feb'16
<b>Computational Biologist (Associate) @ <i>Broad Institute of MIT and Harvard</i></b> - Developed tensor factorization algorithms via modified MCMC for high dimensional visualization (R) - Prototyped distributed algorithms for genome-scale cancer diagnostics (Haskell, R)	Mar'14 - Jan'15
<b>Research Intern (Math) @ <i>Center for Discrete Maths and Theoretical CS</i></b>	Summer'13
<b>Research Assistant (Compilers) @ <i>Worcester Polytechnic Institute</i></b>	Oct'12 - Apr'13
<b>Research Apprentice (Bioinformatics) @ <i>UW Friday Harbor Labs</i></b>	Mar'12 - Jun'12
<b>Research Intern (Biology) @ <i>Whitney Laboratory for Marine Bioscience</i></b>	Summer'11&'12

## PEER-REVIEWED PUBLICATIONS

*Nature* (22/37) "The Ctenophore Genome and the Evolutionary Origins of Neural Systems"

*Neuron* (2/8) "Role of Tet1/3 Genes and Chromatin Remodeling Genes in Cerebellar Circuit Formation"

## OTHER SELECTED PUBLICATIONS AND PRESENTATIONS

- “Compositional Design for Scalable Project Architecture”, Soft. Eng. Symposium, MIT Lincoln Lab, 2015\*  
“Type Systems for Differential Privacy”, Special Topics Seminar, MIT Lincoln Lab, 2015\*  
“Rethinking Inheritance with Algebraic Ornaments”, Formal Methods Seminar, MIT Lincoln Lab, 2015\*  
“Tsunami Awareness and Preparedness in the Greater Wellington Region”, WPI Library 2013†  
“Zero-click, Automatic Assembly, Annotation and Visualization Workflow for Comparative Analysis of Transcriptomes: The quest for novel signalling pathways”, *SICB Annual Meeting*, San Francisco CA, 2013\*  
“A Quest for novel Signaling Molecules in *Pleurobrachia bachei*”, University of Washington Library, 2012†  
“Automatic transcriptome analysis and quest for signaling molecules in basal metazoans”, *SICB Annual Meeting*, Charleston SC, 2012\*  
“Global discovery and validation of signaling molecules in the Ctenophore, *Pleurobrachia bachei*”, *SICB Annual Meeting*, Charleston SC, 2012  
“Genome Wide Analysis of neurotransmitter Signaling in the Ctenophore, *Pleurobrachia bachei*”, *12th Symposium on Invertebrate Neurobiology*, Tihany, Hungary  
“Physics applied to post-stroke rehabilitation - Shoulder Soft Robotics Brace”, SPS Awards Library 2011†  
“Automatic Transcriptome Analysis & Quest for Signaling Molecules in Ctenophore, *Pleurobrachia bachei*”, *Sigma Xi Annual Meeting & International Research Conference*, Raleigh, NC 2011\*  
“Design Considerations for an Active Soft Orthotic System for Shoulder Rehabilitation”, *33rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, Boston, MA 2011\*

\* Personally Presented

† First Author

## AWARDS AND OUTREACH

- AI Safety Research Program, 2019-2020  
MIRI Summer Fellow, 2019  
Long Term Future Fund Grant, 2019  
MIT ASP Graduate Fellowship, 2015  
WPI President’s “Top 5 Interactive-Qualifying-Project Team”, 2014  
BIO REU travel scholarship, 2012  
Whitney Lab REU “Best Research Presentation” travel scholarship, 2011  
Sigma Pi Sigma Undergraduate Research Grant, 2011  
Worcester Technical High School Advisory Board Member  
Splash@WPI founder (Student teaching outreach organization)