Andrew Hill

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Education

University of Washington, Seattle
Ph.D. in Genome Sciences (entering class of 2014)

University of Washington, Seattle
B.S. in Bioengineering with College Honors (2012)
3.79 Departmental GPA; 3.69 Overall GPA

Research Experience

University of Washington Department of Genome Sciences 9/2014 – 9/2014
Graduate Student

- Working with Jay Shendure and Cole Trapnell on a variety of projects within functional genomics, applications of single-cell technologies to dynamic cell responses like differentiation, and computational tools for genomics.

MacArthur Lab of Massachusetts General Hospital/Broad Institute of MIT and Harvard 9/2013 – 9/2015
Research Assistant

- Developed python API and scripts to extract/refine data from Leiden Open Variation Databases.
  - Performed extensive automated validation of variants mapped from HGVS to VCF format.
- Developed methods for automating detection of misannotated protein coding exons in GENCODE using metrics for evolutionary conservation, constraint in a large reference panel, and tissue expression levels.
- Wrote software to detect and analyze multi-nucleotide polymorphisms derived from ~65K exome sequencing samples that change LoF variant interpretation compared to individual variants.
- Led pilot effort with Software Carpentry to implement best software development practices within lab.

Tekscan, Inc. 9/2012 – 1/2014
Applications Engineer

- Conducted engineering research projects for new applications of force and pressure sensors.
  - Implemented machine learning algorithms to estimate shoe-size from pressure sensor data.
  - Signal processing and data analysis for IMU position/angle tracking of human gait.
  - Greatly improved algorithms for gait-analysis from Tekscan pressure sensor data.
- Developed automated test fixtures and data-analysis scripts with MATLAB and LabVIEW.
- Provided engineering support and/or training to customers and all internal departments.

UW Biorobotics Lab (Professors Blake Hannaford and Howard Chizeck) *1/2010 – 6/2012*
Undergraduate Research Assistant

- Thesis: Online Modeling of the *In Vivo* Mechanical Properties of Soft Tissue for Robotic Surgery
  - Designed, built, and programmed electromechanical device to quantify in vivo tissue dynamics.
  - Developed Unscented Kalman Filter/signal processing using MATLAB/C++.
- Co-developed hardware and microcontroller code for haptic-enabled glove.
- Developed hardware and microcontroller code to detect peg-contact in FLS block-transfer task.

Professor Joan Sanders Lab 8/2009 – 1/2010
Undergraduate Research Assistant

- Collected/analyzed data to calibrate tri-axis force sensor for amputee gait analysis.
- Designed and built Plexiglas housing for patient-mounted electronics.

Selected Coursework

Data Visualization (CSE 512)	Applied Biostatistics I (BIOSTAT 517)	Machine Learning (CSE 546)
Embedded Microcomputer Systems (EE 472)	Digital Signal Processing	Signal Processing

Independent Coursework

- Machine Learning — Coursera (Stanford)
- Algorithms Design and Analysis – Part 1 — Coursera (Stanford)
- Circuits and Electronics — MIT Open Courseware
- Manual Machining and Layout (Mill and Lathe) — Artisan's Asylum

Skills

- **Computing:** Python, R, Bash, Java, C#, C/C++, MATLAB, LabVIEW
- **Web Development:** HTML, CSS, JavaScript, D3.js, jQuery
- **Software Development Tools:** Git, Mercurial, Eclipse, Visual Studio
- **Operating Systems:** Windows and UNIX-based operating systems
- **Bioinformatics:** GATK, BED Tools, SAM Tools, VCF Tools, Variant Effect Predictor, UCSC Genome Browser
- **Embedded Systems:** ARM and Arduino embedded system programming
- **Machining:** CNC mill, lathe, band-saw, drill-press, various hand tools

Coaching and Teaching Experience

iD Tech Camps — Summer 2012
Summer Camp Instructor: Programming in Java and Adventures in Robotics

UW Bioengineering Department Circuitry Workshops — Winter 2012
Volunteer Instructor

UW Bioengineering Outreach Program — 12/2011 – 6/2012
Ultrasound Education Module Co-Developer and Instructor

United States Gymnastics Training Camps — Summers 2005 – 2010
Counselor and Coach

Leadership Experience and Activities

Dana-Farber Cancer Institute, Brigham and Women's Hospital — 9/2012 – 4/2013
Volunteer – Kraft Family Blood Donor Center

UW Biomedical Engineering Society — 6/2011 – 6/2012
Vice President and Webmaster

UW Honors Department — 9/2008 – 9/2009
Peer Mentor

Washington Men's Gymnastics Team — 8/2008 – 10/2009
Team Member

Selected Awards and Honors

- National Science Foundation Graduate Research Fellowship (5 year fellowship, 3 years funding)
- Mary Gates Research Scholarship
- Annual Dean's List
- USA Gymnastics Men's Program Scholarship
- Friends of Gymnastics Scholarship

Publications

- Xinxian Deng, Wenxiu Ma, Vijay Ramani, **Andrew Hill**, Fan Yang, Ferhat Ay, Joel B. Berletch, Carl Anthony Blau, Jay Shendure, Zhijun Duan, William S. Noble, and Christine M. Disteche. Bipartite structure of the inactive mouse X chromosome. **Genome Biology 2015 Aug**, 16:152.

Presentations

- **Andrew Hill**, Beryl Cummings, Konrad Karczewski, Monkol Lek, and Daniel MacArthur. "Phased annotation of protein-coding variants across 60,706 human exomes." Presented at the 65th Annual Meeting of The American Society of Human Genetics, **October, 2015** in Baltimore, MD.
- **Andrew Hill**, Xiaojie Qiu, and Cole Trapnell. "Pseudotemporal ordering of cells undergoing immune stimulation and peturbations to cell-cell signaling." Genome Training Grant Symposium invited trainee speaker. **July, 2015**.
- **Andrew Hill**. "Calibration and Synchronized Data Acquisition for High-Speed Applications." Tekscan North American Distributor Meeting. Boston, MA. **April, 2013**.
- **Andrew Hill**, Sina Kosari, Blake Hannaford, and Howard Chizeck. "Online Modeling of the *In Vivo* Mechanical Properties of Soft Tissue for Robotic Surgery." University of Washington Mary Gates Undergraduate Research Symposium. Seattle, WA. **May 2012**.

Study Abroad

- Creative Travel Writing and Sustainability in Ecuador Summer 2010