Seattle, WA

Using science and machine learning, I helped to develop a disruptive, now industrially realized, bio-nano-technology called nanopore sequencing. Now, I'm excited to make more ideas become reality.

EXPERIENCE

Prin	cipal Data Scientist Roche Sequencing Solutions, Santa Clara, CA.	2016-present
•	Created, analyzed, and evolved supervised deep learning strategies in order to both	
	process and understand high volume (>10TB) time-series data.	
•	Designed and implemented machine-learning algorithms, including an adaptive HMM resu	ılting
	in essential improvements in performance metrics.	
•	Developed and maintained analysis tools including training-data selection and preprocess model selection, training, optimization, deployment, and performance tracking.	ing, and the
•	Provided data-informed insights, to allow strategic improvements of the complex device.	
•	Ran weekly meetings within and between multi-disciplinary teams, helping to increase system	em
	understanding and to improve technology and business-related decisions.	
•	Organized and led a machine-learning-focused journal club.	
•	Co-organized an internal hackathon in 2018 - 2020 and won the 2018 hackathon for an im	proved analysis
	tool in cancer detection.	
•	Roche Sequencing Solutions Cultural Belief Champion 2018 & 2019	
<u>Bio</u>	physics Postdoc and PhD student Physics Dept. UW, Seattle, WA. Designed experiments and data acquisition software, and performed and analyzed experiments, and implemented traditional and novel analysis methods and simple pipelines enable the first accurate calling of single-nucleotides DNA sequences from nanopore data. Guided and mentored multiple undergraduate and graduate researchers. Inventor on several patent applications and patents resulting in licensed IP.	2006-2016 to
<u>Con</u>	sultant Illumina, Advanced Research Dept. San Diego, CA. Developed algorithms, analyzed data, and designed experiments to commercialize IP.	2013-2014
Pres	sident of the Career Development Organization at UW. Seattle, WA. Created educational and networking events connecting pre-Ph.Ds with industry.	2009-2011
<u>Hig</u>	h energy physics research Physics Dept. University of Colorado, Boulder. Probed fundamental physics using maximum-likelihood analyses on high volume data	2002-2005

TOOL KIT

<u>Abstract tools:</u> Machine learning, MVP methods (regression, xgboost, random forests etc...). deep-learning, LSTM, convolutions. GANs. time-series data, HMMs. Data management. Statistical and Monte Carlo simulation, <u>Languages and tools</u>: python: tensorflow, pandas, sckitlearn, seaborn, plotly, biopython, firebase; airflow, javascript(basic) C++ (basic), git, docker. GCP: ai platform, bigquery, firebase, cloud, OSX, Linux; pymol

EDUCATION

Cert. in Entrepreneurship and Innovation. Stanford University Grad School of Business	2019
Ph.D. Physics. University of Washington, Seattle, WA	2011
B.S.E. Engineering Physics, Summa cum Laude. University of Colorado, Boulder, CO	2005
B.S.E. in Applied Mathematics. University of Colorado, Boulder, CO	2005

SELECTED PEER-REVIEWED CONTRIBUTIONS

Increasing the accuracy of nanopore DNA sequencing using a time-varying cross membrane voltage M.T. Noakes, H. Brinkerhoff, A.H. Laszlo, I.M .Derrington , K.W. Langford, J.W. Mount, J.L. Bowman, K.M. Doering, B.I.Tickman, J.H. Gundlach. <i>Nature Biotechnology</i> doi: 10.1038/s41587-019-0096-0	2019
Subangstrom Measurements of Enzyme Function Using a Biological Nanopore, SPRNT Laszlo A.H., I.M. Derrington, J.H. Gundlach. <i>Methods Enzymol.</i> doi: 10.1016/bs.mie.2016.09.038	2017
Subangstrom single-molecule measurements of motor proteins using a nanopore. I.M. Derrington J.M. Craig, E.Stava, A.H. Laszlo, B.C. Ross, H. Brinkerhoff, I.C. Nova, K. Doering, B. Tickman, M. Ronaghi, J.G. Mandell, K.L. Gunderson, J.H. Gundlach <i>Nature Biotechnology</i> doi:10.1038/nbt/3357	2015
Decoding long nanopore sequencing reads of natural DNA. A.H. Laszlo, I. M. Derrington , B.C. Ross, H. Brinkerhoff, A. Adey, I.C. Nova, J.M. Craig, K.W. Langford, J.M. Samson, R. Daza, K. Doering, J. Shendure, J.H. Gundlach. <i>Nature Biotechnology</i> doi: 10.1038/nbt.2950	2014
Detection and mapping of 5-methylcytosine and 5-hydroxymethylcytosine with nanopore MspA. A. Laszlo, I. M. Derrington , H. Brinkerhoff, K. Langford, I. Nova, J. Samson, J. Bartlett, M. Pavlenok, J. Gundlach <i>PNAS</i> . doi: 10.1073/pnas.1310240110	2013
<u>Reading DNA with the MspA Nanopore and a Motor Enzyme.</u> E. Manrao, I.M. Derrington , A. Laszlo, K. Langford, M. Hopper, N. Gilgren, M. Pavlenok, M. Niederweis, J. Gundlach. Nat Biotechnol. doi: 10.1038/nbt.2171	2012
Nanopore DNA sequencing with MspA. I.M. Derrington, M. Collins, E. Manrao, M. Pavlenok, M. Niederweis, J.H. Gundlach, <i>PNAS</i> doi: 10.1073/pnas.1001831107	2010
<u>Single Molecule DNA detection with an engineered MspA protein nanopore.</u> T. Butler, M. Pavlenok, I.M. Derrington, M. Niederweis, and J. Gundlach, <i>PNAS 2008</i> doi: 10.1073/pnas.0807514106	2008

SELECTED CONFERENCE ORAL PRESENTATIONS

The Dawn of Nanopore Sequencing.	2016
Invited presentation to the Seattle Sequencing Meetup Group. Seattle, WA	
DNA Sensing with the MspA Nanopore using Variable Voltage.	2014
Platform Presentation at the 58th Annual Meeting of the Biophysical Society. San Francisco, CA	
A Novel DNA Sensing Technique using the Nanopore MspA.	2010
Platform Presentation at the 54th Annual Meeting of the Biophysical Society. San Francisco, CA	

PUBLISHED and APPLIED PATENTS

Nanopore-based analysis of Protein Characteristics United States Patent 10359395	2019
Methods and Compositions for Generating Reference Maps for Nanopore-based Polymer Analysis. App. No. PCT/US/2015/0152495	2015
Composition and Methods of Polynucleotide Sequencing. App. No. PCT/US/2015/0152495	2014
Analyte Sequencing with Nanopores. United States Patent 9588079	2011
Artificial Mycolic Acid Membranes. App. No. PCT/US/2011/025960 Pub. No. 2011/106456	2011