CV: Ian Derrington

Location: Seattle, WA **Web:** ian.ceo, supernal.ai

Summary

Research engineer and scientist working at the intersection of AI systems, biophysics, and safety. PhD Physics. Nine years at Roche building biological sequence models and leading GenAI adoption. Since then: designing and building production multi-agent harnesses, developer tooling, and agentic infra. Published in Nature Biotechnology and PNAS. Multiple licensed patents.

Experience

CTO, Supernal Intelligence and Agent Systems, Seattle, WA (2025 to present)

- Built an AI operating system for biotech companies to help them stay efficient and compliant in their code and activities, so teams can focus on creating value instead of process overhead.

Principal Data Scientist, Roche, Santa Clara, CA (2016 to 2025)

- Co-president of the Responsible Oversight of AI; led pilot partnerships with AI safety organizations; guided internal and external vendor collaboration.
- Product owner: human-in-loop optimization platform for proteins and small molecules.
- Coordinated interdisciplinary teams delivering biochemistry + GPU systems at tera/petabyte scale.
- Wrote production HMM and deep learning algorithms (CNN+RNN) for key milestones.
- Developed and used AI at all levels: deep learning and predictive models, transformer-based Bio-LLMs, and the models and training pipelines to build and improve them. Created training pipelines that multiple teams used to build and change the Bio-LLMs.

Biophysics Postdoc and Grad Student, Physics Dept., University of Washington, Seattle, WA

- Developed pioneering technology showing that nanopores can sequence expanded DNA, delivering fundamental concepts core to state-of-the-art sequencing methods at Roche.
- Demonstrated the first accurate calling of single-nucleotides in DNA using nanopore technology by designing experiments, data acquisition software, data pipeline, and analysis algorithms.
- Designed and tested functional protein sequences for MspA to enable nanopore sequencing.
- Guided and mentored multiple undergraduate and graduate researchers.
- Inventor of several patents resulting in licensed IP by Illumina.

Consultant, Illumina, Advanced Research Dept., San Diego, CA (2013 to 2014)

- Developed algorithms, analyzed data, and designed experiments to industrialize IP.

Technical

- ML/AI: PyTorch, Lightning, Hydra, LangChain, Weights & Biases, Google Vertex.
- Bioinformatics: HMMs, sequence models, nanopore signal processing.

- Languages: Python, TypeScript/JavaScript.
- Data: pandas, numpy, scikit-learn, TensorFlow.

Education

- Cert. in Entrepreneurship and Innovation, Stanford University GSB, Stanford, CA (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

- Nanopore tweezers show fractional-nucleotide translocation in sequence-dependent pausing by RNA polymerase. Nova (listed first), Craig, Mazumder, Laszlo, I.M. Derrington et al. PNAS, 2024, doi:10.1073/pnas.2321017121
- Increasing the accuracy of nanopore DNA sequencing using a time-varying cross-membrane voltage. Noakes, Brinkerhoff, Laszlo, I.M. Derrington et al. Nature Biotechnology, 2019, doi:10.1038/s41587-019-0096-0
- Subangstrom single-molecule measurements of motor proteins using a nanopore. I.M. Derrington (listed first), Craig, Stava et al. Nature Biotechnology, 2015, doi:10.1038/nbt.3357
- Decoding long nanopore sequencing reads of natural DNA. Laszlo, I.M. Derrington et al. Nature Biotechnology, 2014, doi:10.1038/nbt.2950
- Detection and mapping of 5-methylcytosine and 5-hydroxymethylcytosine with nanopore MspA. Laszlo, I.M. Derrington (listed second) et al. PNAS, 2013, doi:10.1073/pnas.1310240110
- Reading DNA at single-nucleotide resolution with a mutant MspA nanopore and phi29 DNA polymerase. Manrao, I.M. Derrington et al. Nature Biotechnology, 2012, doi:10.1038/nbt.2171
- Nanopore DNA sequencing with MspA. Derrington, Collins, Manrao, Pavlenok, Niederweis, Gundlach. PNAS, 2010, doi:10.1073/pnas.1001831107
- Single-molecule DNA detection with an engineered MspA protein nanopore. Butler, Pavlenok, I.M. Derrington, Niederweis, Gundlach. PNAS, 2008, doi:10.1073/pnas.0807514106

Selected published and applied patents

- Nanopore-based analysis of protein characteristics, US Patent 10359395 B2 (granted 2019-07-23).
- Methods and Compositions for Generating Reference Maps for Nanopore-based Polymer Analysis, US Patent 11959133 B2 (granted 2024-04-16; priority 2012).
- Analyte Sequencing with Nanopores, US Patent 9588079 B2 (granted 2017-03-07; filed 2012-08-22; priority 2010).
- Artificial mycolic acid membranes, US Patent 8999716 B2 (granted 2015-04-07; priority 2010-02-23; inventor I.M. Derrington).