Alexander Vaughan

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Brooklyn, NY, USA
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Technologist, scientist, and business leader in biotech and tech. I draw on expertise in ML, neuroscience, and strategy to build tools that change the world.

Experience

Chief Science Officer — ***Pymetrics Inc (NYC)***
2020 –2022

Chief Science officer leading the psychology, machine learning, and MLOps teams to build cognitive assessments that make hiring fair and efficient.

Technical leadership. Transformed a 25-person data science team into a robust MLOps platform, deploying world-class explainable AI using cognitive assessments, bias-regularized AI models, and Bayesian monitoring tools.

Regulatory engagement. Worked to increase transparency and regulatory compliance, including the first 3rd-party audit of any HR/AI company as well as direct engagement with EEOC Chairs and other regulatory stakeholders.

Scientific Founder — ***MapNeuro Inc (NYC/Seattle)***
2018 - 2020

Founder of MapNeuro Inc., a biotech startup focused on using DNA barcoding and in-situ sequencing to address neurodegeneration. I developed the business model, won multiple pitch and incubator awards to support commercialization, and ultimately built out a broad executive team and major Series A investment. Now *Cajal Neuroscience*, operating in Seattle WA.

Scientific Program Manager — ***CSHL / IARPA (NYC)***
2016 - 2020

As part of the IARPA MiCRONS project, I led an interdisciplinary team to build molecular connectomics tools (e.g. MAPseq, BARseq) for understanding the brain. Budget of $1.8M with deep collaborations with MIT and Harvard.

Post-Doctoral Researcher — **Cold Spring Harbor Laboratory (NYC)**
2012 - 2016

My work focused on machine-learning modeling of neural computation, computational image processing, and tooling for new frontiers in biology.

Education

2011 - Ph.D., Biology. Stanford University / Janelia HHMI.
2003 - B.A. Neuroscience *cum laude*. Cornell University.

Patents:

A. Vaughan, A. Zador (2019). Mixseq: mixture sequencing using compressed sensing for in-situ and in-vitro applications. (PCT/US2020/066853) U.S. Patent and Trademark Office. https://patents.google.com/patent/WO2021133911A1

Publications:

R Kohman, A Vaughan, AM Zador, G Church, E Boyden (2022) *Expansion Sequencing of RNA Barcoded Neurons in the Mammalian Brain: Progress and Implications for Molecularly Annotated Connectomics*. [Submitted]

Chen S, J Loper, X Chen, **A Vaughan**, AM Zador, L Paninski (2021) *BARcode DEmixing through Non-negative Spatial Regression (BarDensr)*. PLoS Comput Biol 17(3): e1008256.

J Hirokawa (co-first), **A Vaughan** (co-first), P Masset, T Ott, A Kepecs. (2019). *Frontal cortex neuron types categorically encode single decision variables*. J *Nature 576 (7787), 446-451 65.*

SJ Li, **A Vaughan**, JF Sturgill, A Kepecs (2018). *A viral receptor complementation strategy to overcome CAV-2 tropism for efficient retrograde targeting of neurons*. Neuron 98 (5), 905-917. e5 31.

S Senturk, NH Shirole, DG Nowak, V Corbo, D Pal, **A Vaughan**, et al. (2017). *Rapid and tunable method to temporally control gene editing based on conditional Cas9 stabilization*. Nature Communications 8 (1), 1-10 91.

C Zhou, R Franconville, **A Vaughan** et al. (2015). *Central neural circuitry mediating courtship song perception in male Drosophila*. Elife 4, e08477 63

A Vaughan, C Zhou, DS Manoli, BS Baker. (2014). *Neural pathways for the detection and discrimination of conspecific song in D. melanogaster*. Current Biology 24 (10), 1039-1049 63.

CC Robinett, **A Vaughan**, JM Knapp, BS Baker. (2010). *Sex and the single cell. II. There is a time and place for sex*. PLoS biology 8 (5), e1000365 177.

G Zimmermann, L Wang, **A Vaughan**, et al. (2009). *Manipulation of an innate escape response in Drosophila: photoexcitation of acj6 neurons induces the escape response*. PloS one 4 (4), e5100 26.

Recent Invited Presentations:

A. Vaughan *(2022). NeuroTech and AI*. Wharton Business School.

A. Vaughan *(2022). NeuroTech For Good (And Bad)* AI For Good, NYC.

A. Vaughan, L Baker, F Polli. (2021) *Auditing Fairness – A Collaborative Approach*. Algorithmic Auditing Workshop, Schmidt Futures Foundation

A. Vaughan (2021) *Fairness in AI – Lessons from Practice.* Wharton Annual Analytics Conference.

Programs / Awards / Service

2022	***Mentor**: StealthCo, NYU / I-Corps NYC (molecular biology)*
2022	***Mentor**: StealthCo, Netherlands (cognitive biomarkers)*
2021	***Founder**: AI for Good NYC*
2019	***Incubator**: Creative Destruction Labs / Endless Frontier Labs*
2018	***Incubator**: Alexandria Launchlabs (2018-2020)*
2018	***Award**: Alexandria Launchlabs Innovation Prize ($100k)*
2018	***Incubator**: YCombinator Startup School*
2017	***Award**: LIBH Reach Award ($100k)*
2014	***Fellowship**: Schwartz Foundation / CSHL*
2008	***Fellowship**: Donald Kennedy / Stanford University*
2003	***Endowed Program**: College Scholar Program / Cornell University*