

Ramraj Velmurugan

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Technical skills

- Data warehousing (Snowflake, Redshift)
- Data analytics & sklearn ML modeling (Python)
- Database management (PostgreSQL)
- Webapp development (FastAPI, Flask, Vue.js)
- Data pipeline development (Python, Spark)
- API design and development for data-heavy microservices
- Architecture design and development for end-user products
- CI/CD pipelines & sustainable software practices
- Optimization of data structures/tables for complex queries
- Design async/caching architectures for data-heavy products

Experience

Senior Software Engineer at (Komodo Health Mavens India) *Jan 2022 – present*

DS Tech Lead Contractor at Komodo Health, New York *Oct 2019 – Jan 2022*

- Provide tech-lead and data science contract services to Komodo Health for Prism, their data analytics product
- Spin up the new interfaces team from scratch as part of complete refactor of the organization's technology stack
- Create and productionalize a cohort-creation API that powers every product at Komodo Health (and external customers)
- Create a SQL generation engine that optimizes and generates complex queries to scan terabytes of data in seconds
- Optimize and contribute fully automated data pipelines to the client's snowflake data warehousing platform

Data Scientist at Komodo Health, New York *2018 – Oct 2019*

- Worked as a "full stack data scientist" – fully developing a data analytics tool from prototype to forming a team and being tech-lead of commercial product with > \$10M ARR
- Created a generalized metrics framework to monitor the quality of data passing through various data pipelines
- Created an internal dashboard allowing visualization of terabytes of data using dc.js and highly optimized Redshift indexes
- Developed and productionalized new entity resolution models for previously manually curated data entities
- Developed tree-based ML models that perform entity classification and categorization at scale

Fellow at Insight Data Science, New York *Sep – Dec 2017*

- **Created [TweetMap.live](#) to geolocate and visualize tweets during natural disasters**
 - Engineered a fault-tolerant tweet stream-processing pipeline on Google Cloud that also runs random forest models
 - Collected 18 million tweets about Hurricane Irma, extracted their location from the text and visualized them on a map

Graduate Research Assistant at UT Southwestern Medical Center, Dallas *2009 – 2017*

- 3D super-resolution microscopy data-processing (ramrajv.com/smlm)
- Multidimensional imaging data visualization and analysis (ramrajv.com/mila)

Projects

Co-founder of inferalpha.com, a book-lending startup *09-2014 – 11-2017*

- Implemented the front- and back-end of a children's books-subscription site using ASP and Azure SQL, hosted using Microsoft's BizSpark program
- Implemented payment and inventory management sites for the company administration

Academic software development *08-2009 – 12-2017*

- Worked as part of the UI and software development team for Microscopy Image Analysis Tool (wardoberlab.com/software/mia-tool), for multidimensional data visualization and processing

Education

PhD, Biomedical Engineering *08-2009 – 08-2017*

The University of Texas Southwestern Medical Center at Dallas, TX.

Master of Science, Molecular Biology *07-2008 – 07-2009*

Institute for Research in Immunology and Cancer, Université de Montréal, Canada.

Bachelor of Technology, Industrial Biotechnology *06-2004 – 04-2008*

AC College of Technology, Anna University, Chennai, India

Publications

	Citations	Year
Microscopy data analysis:		
▪ Sage D, Pham TA, ... Velmurugan R , ... Holden S. (7 th of 20 total authors) Super-resolution light club: a assessment of 2D and 3D single-molecule localization microscopy software. Nature Methods .	182	2019
▪ Lin D, Lin Z, Cao J, Velmurugan R , Ober RJ, Ward ES. A two-stage method for automated detection of ring-like endosomes in fluorescent microscopy images. PLoS ONE .	5	2019
▪ Velmurugan R , Chao J, Ram S, Ward ES, and Ober RJ. Intensity-based axial localization approaches for multifocal plane microscopy. Optics Express .	8	2017
▪ Chao J, Velmurugan R , You S, Kim D, Ward ES and Ober RJ. Remote focusing multifocal plane-microscopy for the imaging of 3D single molecule dynamics with cellular context. Proceedings of SPIE .	-	2017
▪ Lin D, Lin Z, Velmurugan R , Ober RJ. Automatic endosomal structure detection and localization in fluorescence microscopic images. IEEE International Symposium on Circuits and Systems .	1	2017
Cell biology:		
▪ Velmurugan R , Ramakrishnan S, Kim M, Ober RJ, Ward ES. Phagocytosis of antibody-opsonized tumor cells leads to the formation of a discrete vacuolar compartment in macrophages. Traffic .	8	2018
▪ Hyenne V, Tremblay-Boudreault T, Velmurugan R , Grant BD, Loerke D, Labbé JC. RAB-5 controls the cortical organization and dynamics of PAR proteins to maintain <i>C. elegans</i> early embryonic polarity. PLoS ONE .	28	2012
Therapeutic antibody biology:		
▪ Challa DK, Wang X, Montoyo HP, Velmurugan R , Ober RJ, Ward ES. Neonatal Fc receptor expression in macrophages is indispensable for IgG homeostasis. mAbs .	21	2019
▪ Khare P, Challa DK, Devanaboyina SC, Velmurugan R , Hughes S, ... Ober RJ, Ward ES. Myelin oligodendrocyte glycoprotein-specific antibodies from multiple sclerosis patients exacerbate disease in a humanized mouse model. Journal of Autoimmunity .	19	2018
▪ Velmurugan R , Challa DK, Ram S, Ober RJ, Ward ES. Macrophage-mediated trogocytosis leads to death of therapeutic antibody-opsonized tumor cells. Molecular Cancer Therapeutics .	54	2016
▪ Li R, Chiguru S, Li L, Kim D, Velmurugan R , Kim D, ... Mason R, Ober RJ, Ward ES. Targeting phosphatidylserine with calcium-dependent protein-drug conjugates for the Treatment of Cancer. Molecular Cancer Therapeutics .	8	2017
▪ Challa DK, Velmurugan R , Ober RJ, Ward ES. FcRn: From Molecular Interactions to Regulation of IgG Pharmacokinetics and Functions. Fc Receptors . (Book chapter)	67	2014
▪ Ward ES, Velmurugan R , Ober RJ. Targeting FcRn for therapy: from live cell imaging to in vivo studies in mice. Immunology Letters .	11	2014
▪ Bansal P, Khan T, Bussmeyer U, Challa DK, Swiercz R, Velmurugan R , Ober RJ, Ward ES. The encephalitogenic, human myelin oligodendrocyte glycoprotein-induced antibody repertoire is directed toward multiple epitopes in C57BL/6-immunized mice. Journal of Immunology .	17	2013