

Dr Vasanth Muthusamy

PhD (Medicine) · MPhil · BS Optometry

Clinician-scientist · Computational research · Clinical AI · Technology strategy

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Who I am

Clinician-scientist with a PhD in Medicine from the University of Melbourne and 12 years across clinical practice, computational research, clinical AI, digital health and research translation. Clinical practice taught me that a result is only as trustworthy as the measurement behind it, and computational research taught me how uncertainty enters the data. I define the research question, develop and evaluate the methods, build the data foundations that clinical evidence depends on, and lead multidisciplinary teams through delivery. My work covers disease-prediction algorithms and clinical AI evaluation, GCP-compliant clinical research and real-world evidence, clinician, patient and community engagement, and scientific and commercial due diligence with industry partners. The value I bring is determining what the evidence supports, where uncertainty remains, and what is worth developing next, whether a research direction, a technology or an investment.

Selected impact

Cross-functional leadership

Led work that had no single owner: identified the capability gap, defined the solution, brought clinicians, researchers, technical teams and external partners around it, validated the result and saw it into use. Led project and research teams since 2014, across clinical, engineering, academic and commercial settings.

Algorithm and method development

Developed a machine-learning disease-prediction model on a population-based epidemiological cohort (2016), leading six undergraduate researchers through validation and statistical analysis. In doctoral research, developed adaptive testing algorithm variants that spend limited measurement effort where it adds the most information; these are implemented in an ongoing longitudinal clinical study.

Clinical data at scale

Extracted and cleaned 900,000 clinical test records, approximately 49 million individual measurements, for my master's research. At Lions Eye Institute, led the extraction, linkage and standardisation of around 500,000 EMR and diagnostic records into research-ready infrastructure for real-world evidence, with an OMOP-based path towards FHIR/HL7.

Clinical AI research

Developed and conducted a clinical NLP study evaluating relationship extraction and clinical inference by large language models against clinician-reviewed annotations: where model inference goes beyond what the note supports, and what that means for using these systems on clinical text.

Clinical research, patient voice and expert engagement

Good evidence needs the right people in it from the start: patients, consumers, clinicians and international experts. Led operations, ethics and risk for a GCP-compliant longitudinal study, ran a patient-priorities study with 152 responses, conducted an expert-judgement study across four countries with 22 recruited and 18 analysed, and convened a 45-expert scientific exchange.

Translation and partnerships

Scientific and commercial due diligence informing an executive go/no-go decision on a pharmaceutical partnership; recognised pre-publication IP that progressed through an accelerator into a digital-health company; advised on approximately 20 NHMRC applications.

Professional experience

Research Data Manager

Lions Eye Institute · Perth, Australia

May 2023 – present

A cross-functional role across research, clinical data and AI, reporting into executive leadership and working with clinical, technical and industry teams.

Clinical AI and evaluation

- Developed and conducted a clinical NLP study on relationship extraction and clinical inference by large language models, defining the evaluation framework: what counts as a correct answer, how ambiguity and missing context are treated, and how unsupported certainty is detected. Now extending it with a larger dataset and a pre-specified analysis plan.

- Supervise an honours research project on medication–eye relationship extraction within the same programme of work, and four computing interns across data linkage, standardisation and technical delivery; informally mentor doctoral researchers.
- Advise executive leadership and research teams on where clinical AI can and cannot be relied upon, and on the data quality, provenance and governance needed to interpret model performance.

Clinical data infrastructure and real-world evidence

- Led the extraction, linkage and standardisation of around 500,000 clinical EMR and diagnostic records, building reusable, research-ready infrastructure for longitudinal research and real-world evidence.
- Shaped an OMOP-based interoperability direction with a roadmap towards FHIR/HL7, connecting research requirements to data quality, provenance and operational delivery.
- Co-designed the data strategy and analysis plan for a population-based comparison of two visual-field testing strategies; co-author of the resulting 2026 publication.
- Contribute to clinical and research data governance, access, stewardship and integrity as a member of the Clinical and Research Data Management Committee.

Clinical research operations

- Lead data and research operations for IPPOS, a longitudinal clinical evaluation study: protocol support, site validation, ethics processes, standard operating procedures, risk management, clinician training, patient recruitment and clinical examination, quality control and continuity planning.
- Build and maintain the study's data infrastructure and workflows in REDCap and R Shiny; clean, de-identify and prepare the data for analysis, and write the resulting papers. The study includes clinical evaluation of the ARREST procedure, which I evaluated in my doctoral research.

Digital health, service delivery and partnerships

- Expanded an existing home eye-pressure monitoring service across multiple clinicians: patient onboarding and training, clinical workflows, supplier engagement, procurement and resource planning. Built the supporting data infrastructure and specified the booking and device-tracking system for the software team, improving how the service was run.
- Built the strategy and business case for a separate home-monitoring platform proposal: market and user research, service design, financial modelling, reimbursement and regulatory pathways, and build-versus-partner assessment.
- Identified an industry opportunity and opened the relationship with a medtech partner at global vice-president of product level; the engagement developed into a research collaboration, which I supported through ethics and implementation planning.

Assistant Grants Advisor

Jan 2023 – May 2023

Walter and Eliza Hall Institute of Medical Research (WEHI) · Melbourne, Australia

- Advised on approximately 20 applications within an institutional portfolio of approximately 70 NHMRC submissions, supporting scientific positioning, writing, eligibility and compliance.
- Coordinated investigators and professional services around submission requirements, institutional inputs and deadlines; at least three applications I advised on were subsequently funded.

Research Commercialisation & Business Development Intern

Jun 2022 – Dec 2022

The University of Melbourne · Research Innovation & Commercialisation, Innovation & Enterprise

University–industry business development across the Medicine and Life Sciences portfolio, including infectious disease, HIV, vaccines, immunology, gene therapy and cell therapy.

- Carried out innovation scouting, scientific and commercial due diligence, technology assessment and market research to support pharma–university partnerships.
- Assessed scientific credibility, strategic fit and partner risk for a proposed pharmaceutical collaboration, informing an executive go/no-go decision.
- Recognised product and IP potential in pre-publication research and connected the researcher with business development and technology-transfer support; the opportunity subsequently progressed through an accelerator into a digital-health company.
- Prepared non-confidential technology briefs and investor-facing materials, and led coordination between researchers, clinicians, university teams, investors, legal and technology-transfer advisers and industry partners around partnership and R&D opportunities.

- Coordinated multi-party agreement processes involving the University and Australian public-health organisations, and supported innovation pitch events and partner-facing activities.

Junior Research Fellow

Jul 2016 – Apr 2017

Vision Research Foundation / Sankara Nethralaya · Chennai, India

- Led a paediatric electrophysiology research project end to end: ethics approval, protocol development, system build and pilot testing, coordinating clinicians and a biomedical engineering team.
- Developed a machine-learning disease-prediction model using a population-based epidemiological glaucoma dataset, leading six undergraduate researchers through validation and statistical analysis.

Optometrist

Jul 2014 – May 2016

Sankara Nethralaya · Chennai, India

- Consulted patients in the glaucoma service and led the anterior-segment OCT diagnostic imaging clinic within a high-volume tertiary eye hospital.
- Led undergraduate and masters student research projects, taught optometry coursework and contributed to clinician education and continuing professional development.
- Coordinated an international eye-health and vision-science conference and its professional education programme (2015).

Education

Doctor of Philosophy (Medicine)

2017 – 2022

The University of Melbourne, Australia

- Computational research on clinical measurement, spatial sampling, uncertainty and clinical evaluation: how to extract a reliable signal from a noisy biological measurement, and how to spend limited testing effort where it adds the most information.
- First-author clinical evaluation of the ARREST procedure (2020) and first-author patient-priorities study with 152 complete survey responses (2022).
- Conducted an international expert-judgement study with a panel of 18 experts drawn from a clinician-scientist network across Australia, the United States, the United Kingdom and India; convened an online scientific exchange for approximately 45 international experts.

Master of Philosophy

2014 – 2016

BITS Pilani, India

- Health data science, epidemiology and biostatistics, including machine-learning approaches to disease diagnosis and the processing of large clinical measurement datasets.

Bachelor of Science (Optometry)

2010 – 2014

BITS Pilani, India · Clinical training, community eye-health initiatives, and work with underserved populations and children with special needs

Peer-reviewed publications

Small areas of damage due to glaucoma are less likely to be identified by SITA-Faster than SITA-Standard. *Optometry and Vision Science*. 2026;103(3):e70032. Co-author · doi.org/10.1002/ovs2.70032

A structure–function dataset with known rates of glaucomatous progression. *Translational Vision Science & Technology*. 2026;15(2):28. Co-author · doi.org/10.1167/tvst.15.2.28

Patients' views of visual field testing and priorities for research development and translation into practice. *Ophthalmology Glaucoma*. 2022;5(3):313–324. First author · doi.org/10.1016/j.ogla.2021.10.003

Increasing the spatial resolution of visual field tests without increasing test duration: an evaluation of ARREST. *Translational Vision Science & Technology*. 2020;9(13):24. First author · doi.org/10.1167/tvst.9.13.24

Frequency doubling perimetry and short wavelength automated perimetry. In: *New Investigations in Ophthalmology*. Jaypee Brothers Medical Publishers; 2018. Book chapter · Co-author · doi.org/10.5005/jp/books/13095_14

International conference presentations with competitive travel awards.

Capabilities

Research and evaluation. Study design; computational analysis; measurement science; test-retest variability; spatial sampling; expert agreement and annotation quality; mixed-methods and patient research; longitudinal real-world evidence; scientific writing and publication.

Data, AI and technical. Python; R; machine learning; clinical NLP and LLM evaluation; REDCap; R Shiny; ETL and DICOM workflows; Power BI; Git/GitHub; Docker; REST APIs; AI-assisted prototyping.

Clinical and research operations. Clinical workflows; patient education; clinician and KOL engagement; GCP study operations; protocols, SOPs and quality control; resource planning; research-data quality and interoperability; OMOP and FHIR/HL7 planning.

Strategy and partnerships. Innovation scouting; scientific and commercial due diligence; market and competitive analysis; business cases; financial modelling; pricing and reimbursement; build-versus-partner assessment; university-industry partnerships; grants development; regulatory strategy and TGA SaMD pathway assessment.

Governance and leadership. Research governance; data stewardship, access and provenance; responsible AI; AI maturity and readiness assessment; cross-functional delivery; executive briefs; supervision and mentoring; stakeholder coordination and negotiation.

Recognition and professional development

Scientific peer review · 2026. Reviewer for *Ophthalmic and Physiological Optics* (Springer Nature).

Medicines Australia · 2025. Code of Conduct CEP, Edition 20: the compliance framework for medical affairs, ethical promotion and professional communication in the pharmaceutical industry.

MTPConnect Bridge & BridgeTech · 2024. Pharmaceutical and medtech commercialisation training: regulatory strategy, reimbursement, HTA and market access.

Brooker Mentorship Program · 2024. Selected for the Australian and New Zealand life-sciences leadership programme.

ICH Good Clinical Practice · 2023. The international standard for ethical, reliable clinical research.

Quality Management Systems · 2022. Professional training.

Current research

Verification after apparent change

Ongoing research. How a repeat measurement changes the interpretation of apparent deterioration, conditional on prior history, measurement variability and the cost of false reassurance. The same question governs model alerts and monitoring thresholds.

Expert judgement and annotation quality

Manuscript in preparation. Within- and between-clinician consistency in selecting additional measurement locations, and what it means for treating expert annotations as a reference standard.

Ambiguity in clinical text

Active project. Evaluating medication-eye relationship extraction and clinical inference by large language models against clinician-reviewed annotations, with attention to missing context, ambiguity and unsupported certainty.