

BIOGRAPHICAL SKETCH

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NAME: Prasanth Ganesan, PhD

eRA COMMONS USER NAME (credential, e.g., agency login): PRASANTH.GANESAN

POSITION TITLE: Research Scientist

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.*)

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Anna University, India	B.E.	05/2013	Electronics Engineering
Rochester Institute of Technology, NY	M.S.	05/2015	Electrical Engineering
US National Institutes of Health, Bethesda	Fellowship	2018	Artificial Intelligence in Biology
Florida Atlantic University, Florida	Ph.D.	08/2019	Electrical Engineering
Stanford University, California	Postdoc Research	02/2020 – 11/2023	Bioengineering
Stanford University, California	Research Scientist	11/2023 -	Bioengineering

A. Personal Statement

My primary research interest is in studying arrhythmia mechanisms using bioengineering and computational approaches. My postdoctoral research, and my Master's and PhD degrees were focused on mapping abnormal electrical activity in atrial fibrillation using numerical simulations and clinical validation. Prior to working in Dr. Narayan's group, I worked closely with Dr. Elizabeth Cherry, a pioneer in simulations of cardiac arrhythmia, and with renowned biophysicist, Dr. Arkady Pertsov, who published the earliest optical mapping studies of cardiac fibrillation. I also have experience in artificial intelligence approaches for biological problems during my graduate fellowship at the US National Institutes of Health in 2018. I briefly pursued biomedical innovations in Industry before joining Stanford to pursue my translational ideas. My long-term career goal is to become an independent bioengineer who combines computational and experimental methods to decode arrhythmia mechanisms, and translates them to novel clinical tools. The following are some selected publications.

- Ganesan P.**, Pedron M., Feng R., Rogers A.J., Deb B., Chang H.J., Ruiperez-Campillo S., Srivastava V., Brennan K., Giles W.R., Baykaner T., Clopton P., Wang P.J., Schotten U., Krummen D.E., Narayan S.M., "Comparing Phenotypes for Acute and Long-Term Response to Atrial Fibrillation Ablation Using Machine Learning", *Circulation: Arrhythmia and Electrophysiology*, 2025 (in press).
- Ganesan P.**, Deb B., Feng R., Rodrigo M., Ruiperez-Campillo S., Rogers A.J., Clopton P., Wang P.J., Zeemering S., Schotten U., Rappel W-J, Narayan S.M., "Quantifying a Spectrum of Clinical Response in Atrial Tachyarrhythmias Using Spatiotemporal Synchronization of Electrograms", *Europace*, 2023, 25(5):euad055, 2023
- Ganesan, P.**, Salmin, A.J., Cherry, E.M., Huang, D., Pertsov, A.M. and Ghoraani, B., "Iterative Navigation of Multipole Diagnostic Catheters to Locate Atrial Fibrillation Rotor Sites", *Journal of Cardiovascular Electrophysiology*, 30(5), pp.758-768, 2019.
- Ganesan, P.**, Cherry, E.M., Huang, D., Pertsov, A.M. and Ghoraani, B., "Atrial Fibrillation Source Area Probability Mapping Using Electrogram Patterns of Multipole Catheters", *Biomedical Engineering Online*, 19(1), pp.1-23, 2019.

B. Positions, Scientific Appointments, and Honors

Professional Experience

2014-2016	Teaching Assistant, Rochester Institute of Technology, New York, USA
2014-2017	Graduate Research Assistant, Rochester Institute of Technology, New York, USA
2017-2018	Graduate Research Assistant, Florida Atlantic University, Florida, USA
2018-2019	Teaching Assistant, Florida Atlantic University, Florida, USA
2019-2020	Senior Engineer for Intracardiac Signal Recording System, Biosig Technologies Inc., Los Angeles, USA
2020-2023	Postdoctoral Research Fellow, Stanford Medicine, California, USA
2023-present	Research Scientist, Stanford Medicine, California, USA

Honors and Professional Activities

2025	Editors' Pick Research Article, Circulation: Arrhythmia and Electrophysiology Journal
2024	Heart Rhythm Society 2024 Young Investigator Award Finalist (shared with co-author)
2023-	Review editor, Frontiers in Physiology Journal
2023	1 st Prize, Fellows Research Award, Western Atrial Fibrillation Symposium 2023
2022	Forbes 30 Under 30 Asia 2022 for Healthcare and Science.
2022-	Committee Member, MICCAI Artificial Intelligence Workshop Titled: "Medical Image Learning with Limited and Noisy Data".
2021	Best Poster Prize, Atrial Signals 2021, Karlsruhe Institute of Technology, Germany.
2020	Moderator, AHA Scientific Sessions Nov 13, 2020, Session: "AF: Novel Targets".
2020-	Reviewer, Nature Digital Medicine, Nature Scientific Reports, Journal of the American College of Cardiology (JACC-EP), Journal of Cardiovascular Electrophysiology (JCE), Frontiers in Physiology, Computers in Biology and Medicine, IEEE Access, PLOS One, IEEE Biomedical and Health Informatics, BMC Medical Imaging, PeerJ Computer Science, and other.
2019	The Provost Honorary Recognition for Publishing, Florida Atlantic University
2018	Invited lecture, US National Library of Medicine, "Evaluating Generative Adversarial Networks for Medical Image Synthesis and Restoration".
2016	1 st prize, Student Paper Open Finalist and \$500 travel award, IEEE Engineering in Medicine and Biology Society.

C. Contributions to Science

1. I have developed a novel mapping approach to quantify regional areas of repeating electrograms in atrial fibrillation (Repetitive Activity Mapping), which we validated in a large AF registry at Stanford, and extended using computational models to calibrate electrical variability in organized and less organized rhythms. Machine learning demonstrated that REACT with clinical data predicts patients who are more likely to have AF termination by ablation. Before joining Stanford, I developed novel mapping algorithms using signal processing of data from high resolution mapping catheters to identify locations of spiral reentry waves and centrifugal focal waves in atrial fibrillation, collaborating with Dr. Elizabeth Cherry at Georgia Institute of Technology, and Dr. Arkady Pertsov at Upstate Medical University. The developed approach showed a high robustness on numerical simulations and also in retrospective evaluation on clinical data.
 - a. Rappel, W.J., Baykaner, T., Zaman, J., **Ganesan, P.**, Rogers, A.J. and Narayan, S.M., "Spatially Conserved Spiral Wave Activity During Human Atrial Fibrillation", Circulation: Arrhythmia and Electrophysiology, 17(3), p.e012041, 2024
 - b. C. Kappel, M. Reiss, M. Rodrigo, **P. Ganesan**, S. M. Narayan and W. J. Rappel, Predicting acute termination and non-termination during ablation of human atrial fibrillation using

quantitative indices. *Front Physiol* 2022 Vol. 13 Pages 939350. Accession Number: 36483297
PMCID: PMC9725096 DOI: 10.3389/fphys.2022.939350, 2022

- c. **Ganesan P**, Narayan SM. Re-evaluating the multiple wavelet hypothesis for atrial fibrillation, *Heart Rhythm*, 17(12), p.2219, 2020.
 - d. Abad R., Collart O., Rogers AJ., **Ganesan P.**, Alhusseini M., Rodrigo M., Narayan SM., Rappel WJ., “Three-Dimensional Reconstruction to Visualize Atrial Fibrillation Activation Patterns on Curved Atrial Geometry”, *PLOS One*, 16(4), p.e0249873, 2021.
2. I am interested in applying artificial intelligence (AI) to tackle biological problems and I gained experience in generative AI during my appointment at the US National Institutes of Health. I worked alongside scientists to implement AI approaches for cervical cancer image processing and diagnosis of pneumonia using chest x-rays. Some of my recent studies at Stanford are also on analyzing AF using AI. I used explainable AI to compare phenotypes between acute and long-term outcomes of AF ablation. I also used deep learning integrated with domain knowledge to segment different structures of atrium from CT images.
- a. **Ganesan, P.**, Feng, R., Deb, B., Tjong, F.V., Rogers, A.J., Ruipérez-Campillo, S., Somani, S., Clopton, P., Baykaner, T., Rodrigo, M. and Zou, J., “Novel Domain Knowledge-Encoding Algorithm Enables Label-Efficient Deep Learning for Cardiac CT Segmentation to Guide Atrial Fibrillation Treatment in a Pilot Dataset”, *Diagnostics*, 14(14), p.1538, 2024.
 - b. **Ganesan, P.**, Sterling, M., Ladavich, S., Ghoraani, B. “Computer-Aided Clinical Decision Support Systems for Atrial Fibrillation”, *Computer-aided Technologies - Applications in Engineering and Medicine, InTech*, 2016
 - c. **Ganesan, P.**, Rajaraman, S., Long, R., Ghoraani, B., Antani, S., “Assessment of Data Augmentation Strategies Toward Performance Improvement of Abnormality Classification in Chest Radiographs”, *Engineering in Medicine and Biology Society Conference (EMBC), IEEE*, pp. 841-844, 2019
 - d. Rajaraman, S., **Ganesan, P.**, Antani, S. Deep learning model calibration for improving performance in class-imbalanced medical image classification tasks. *PLoS one*, 17(1), p.e0262838, 2022.