Anandh Kilpattu Ramaniharan

BE (ECE) **ME** (Applied Electronics) **Ph.D.** (Neuroimaging)

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1. Career Objective:

To advance MRI research through technical innovation, clinical translation, and sustained academic and research leadership.

2. Summary: Technical competencies and soft skills

- Ph.D. in Neuroimaging with 9+ years of experience in clinical settings to develop novel MR clinical solutions to address pathologies and disease conditions of local and global interests.
- Proven ability to collaborate with academicians, MR Physicists, Radiologists, and Neurologists on multiple interdisciplinary projects to transfer research outcomes into tailored clinically relevant solutions.
- Demonstrated experience in design, and implementation of indigenous image processing algorithms to analyze 1.5T, 3T and 7T MR images (example: anatomy (hippocampus) segmentation and clinically relevant feature extraction).
- Good proficiency in (1) programming languages like MATLAB and Bash Scripting, (2) toolboxes like FSL, SPM, FreeSurfer, MeshLab and MeshMixer, (3) high-performance computing to quickly create prototype models, and Paradise Virtual Machine (Philips MR Software).
- Project management and leadership skills, experience in writing grants, final reports, and study manuals.
- Good track record of publishing scientific research findings in top tier journals (like Epilepsia, JMRI, Pediatric Radiology, Abdominal Radiology and HBM) and international conferences (like ISMRM, AES, and IEEE ISBI and EMBS).
- Trained to operate Philips 3T MRI scanner (to conduct phantom and volunteer scans) including data management.
- Excellent analytical, interpersonal, and communication skills, eagerness to learn, result-oriented, excellent ownership and entrepreneurial attitude.

3. Post-Ph.D. Research Experience:

3.1. *Outline of works at 'Cincinnati Children's Hospital Medical Center, USA'*.

- Worked with MR physicists, pediatric Neurologist, and Radiologists to provide solutions to improve pediatric healthcare.

- Established a lab with the PI to apply rapid MR acquisition methods for pediatric subjects to avoid sedation during scanning (Brain and whole abdomen).

- Data acquisition, management, and analysis of accelerated cum quantitative MR imaging methods using 3T and 1.5T MRI scanners.

- Recently, developed rapid and high resolution hippocampal imaging method for pediatric population.

- Example key projects:

    1. Conducted phantom scans at 3T using a rapid acquisition method called Multiple Inversion Spin and Gradient Echo (MI-SAGE) sequence.
    2. Implemented a pipeline for generating multiple synthetic image contrasts from quantitative relaxometry maps using a single one-minute brain scan (MI-SAGE) method.
    3. Analyzed the data for the evaluation of confounding influence of fat on hepatic quantitative parametric mapping.
    4. Analyzed the efficacy of free-breathing simultaneous T_1, T_2, and T_2^* mapping of the whole-liver with MI-SAGE sequence in under a minute.
    5. Developed a method for high resolution hippocampal imaging to demonstrate hippocampal dentation and subfields.
    6. The research findings were published in a peer-reviewed journal (JMRI) and international conferences like SPR and ISMRM.

3.2. *Outline of works at 'The University of Alabama at Birmingham, USA'*.

- Performed indigenous research and provided MRI-based solutions to healthcare providers in the field of Epilepsy.

- Established a lab with PI to develop computational and quantitative methods to analyze high resolution epileptic MRI data towards improving patient care.

- Data acquisition, management, and analysis of ultra-high-resolution hippocampal imaging at 3T and 7T.

- Example key projects:

1. Developed a novel pipeline for the segmentation of hippocampi using ultra-high-resolution approach implemented through FSL and ASHS software.

2. Developed an objective method to quantify hippocampal dentation (folds in the inferior aspect of the hippocampus) in healthy controls and temporal lobe epileptic subjects using MATLAB to investigate the relationship between dentation and memory performance.

3. Implemented a pipeline of steps to generate 3D surface meshes of the whole hippocampus using subfield segmentation results and high-resolution atlas using FSL, MeshLab, and high-performance computing.

4. Implemented High-Resolution Multiple Image Co-Registration and Averaging (HR-MICRA) algorithm using FSL to investigate hippocampal internal architecture clarity across 3T and 7T scans.

5. Developed a novel high-resolution atlas (0.5mm) for the first time to automatically segment SRLM (hippocampal subfield) using ASHS software.

6. The research findings were published in three peer-reviewed journals and international conferences like OHBM, AES, sfn, IEEE SPMB, and ISMRM.

3.3. *Outline of works at 'Philips Healthcare India Private Limited, India'.*

- Worked at Philips clinical site (Fortis Memorial Research Institute, Gurgoan) towards providing consistently high-quality research support to the clinical customer to deliver definitive diagnoses and prognostic treatment plans.

- Collaborated with stakeholders (MR physicists, clinical scientists, applications specialists, clinical end-users, and Philips global leaders) to understand and transform unmet pressing clinical problems into valuable solutions to improve patient care.

- Investigated the efficacy of newly developed clinical application techniques (in MR image post-processing) with radiologists, clinicians, and end users in in-house and clinical environments.

- Example key projects:

    1. Analyzed the performance of T1 perfusion MRI using compressed SENSE and its application in glioma grading.

    2. Analyzed a MATLAB based framework (in collaboration with IIT-Delhi) for the segmentation and quantification of different tumor components using T1-perfusion MRI and evaluated its influence in tumor grading.

3. Collection and analysis of 3T SWI MR data for gall bladder stone detection.

4. The research findings were published in 4 peer-reviewed journals and 4 international conferences.

3.4. *Outline of works at 'Anna University and IIT-Madras during Ph.D. in India'*

- Devised a MATLAB based strategy for the analysis of brain sub-anatomic structures in Alzheimer MR images using shape analysis methods.

- Improved the performance of level set methods for the segmentation of regions involving weak boundaries using various edge enhancements methods. The pipeline was used to segment regions like breast thermograms, corpus callosum, and lateral ventricles.

- The research findings were published in 8 peer-reviewed journals and 4 international conferences.

4. List of significant publications:

4.1. Journal papers

4.1.1. **Kilpattu Ramaniharan A**, Kemp J, Kocaoglu M, Trout A, Dillman J, Manhard MK, Pednekar A, "Comparison of hepatic PDFF, T2*, and T2 estimates from breath-hold and free-breathing respiratory-gated MRI acquisitions in children and young adults". Abdominal Radiology, pp. 1-9, 2025.

4.1.2. **Kilpattu Ramaniharan, A**., Pednekar, A., Parikh, N.A., Nagaraj, U., Manhard, M.K., "A single 1-min brain MRI scan for generating multiple synthetic image contrasts in awake children from quantitative relaxometry maps". Pediatric Radiology, Vol. 55(2), pp. 312-323, 2025.

4.1.3. **Kilpattu Ramaniharan, A**., Zhang, M.W., Papura, V., Martin, R. and Ver Hoef, L., "Development of an objective method to quantify hippocampal dentation". Human Brain Mapping, Vol. 44(8), pp. 2967–2980, 2023.

4.1.4. **Kilpattu Ramaniharan, A.,** Zhang, M.W., Selladurai, G., Martin, R. and Ver Hoef, L., "Loss of hippocampal dentation in hippocampal sclerosis and its relationship to memory dysfunction". Epilepsia, Vol. 63, pp.1104-1114, 2022.

4.1.5. **Anandh K Ramaniharan**, Sujatha C Manoharan, Ramakrishnan Swaminathan, "Laplace Beltrami eigen value based classification of normal and Alzheimer MR images using parametric and non-parametric classifiers", Expert Systems with Applications, Vol. 59, pp. 208-216, 2016.

4.2. Abstracts

4.2.1. **Anandh K Ramaniharan,** Greer Josh, Andrew Trout, Jonathan Dillman, Amol Pednekar, and Mary Kate Manhard. 'Free-breathing respiratory gated multi echo gradient spin echo MRI for hepatic T2 estimation'. The Society for Pediatric Radiology, May 2025, Hawaii, USA.

4.2.2. **Anandh K Ramaniharan**, Amol Pednekar, Nehal Parikh, Usha Nagaraj, and Mary Kate Manhard. 'Evaluation of a rapid multi-parametric quantitative brain mapping method in awake children'. ISMRM, April-2024, Singapore.

4.2.3. **Anandh K Ramaniharan**, Goutham Selladurai, and Lawrence Ver Hoef. 'Hippocampal dentation based differentiation of healthy controls and epileptic subjects using high resolution MR images'. Society for Neuroscience. November-2021, USA.

4.2.4. **Anandh K Ramaniharan**, Mike Zhang, Roy Martin, Vuga Parpura, Goutham Selladurai, and Lawrence Ver Hoef. 'An objective method to quantify hippocampal dentation and predict the side of seizure onset in temporal lobe epilepsy'. American Epilepsy Society, December-2020, USA.

4.2.5. Lawrence Ver Hoef, Mike Zhang, and **Anandh K Ramaniharan**. 'Quantifying Hippocampal Dentation in Epilepsy: a comparison of absolute mean curvature versus visual inspection and their memory correlates. ISMRM, August-2020. (Virtual).

5. Total number of publications until now:

5.1. Peer-reviewed journals: 29
5.2. International conferences: 40
5.3. Google Scholar Citations: 361

Google Scholar Link: https://scholar.google.com/citations?hl=en&user=EAbjdngAAAAJ&view_op=list_works&sortby=pubdate

6. Served as a Reviewer for the following Journals and Grant:

Journals: Journal of Neuroscience Methods, Journal of Medical Systems, Computers Methods and Programs in Biomedicine, Frontiers in Oncology, Neurosurgical Review, BMC Medical Informatics and Decision Making, Neuroradiology, and Multimedia Tools and Applications.

Grants: Strauss Postdoc Fellowship awards, CCHMC, USA.

Editorial board member: BMC Medical Imaging.

7. Industry/Research/Academic Experience till date:

Independent Research Consultant	Mentoring PhD scholars through collaborations and serving as active Editorial Board Member for BMC Medical Imaging from 01/09/2025 to till date.
Cincinnati Children's Hospital Medical Center, 3333, Burnet Ave, Cincinnati-45229, United States.	Worked as an **Associate Staff Scientist** in Imaging Research Center, Department of Radiology for a period of **35 months** from 01.08.2022 to 25.07.2025.

The University of Alabama at Birmingham (UAB), Alabama-35294, United States.	Worked as a **Postdoctoral Fellow** in the department of Neurology, Epilepsy division for a period of **45 months** from 21.09.2018 to 06.30.2022.
Philips Healthcare India Private Limited, Philips Innovation Campus, Bengaluru-560045, Karnataka, India.	Worked as an **MR R&D Consultant** for a period of **19 months** from 4.1.2017 to 31.7.2018.
Indian Institute of Technology Madras, Chennai-600036, Tamilnadu, India	Worked as a **Project Officer in the Department of Applied Mechanics** for a period of **15 months** from 1.6.2015 to 30.9.2016.
CEG Campus, Anna University, Chennai-600025, Tamilnadu, India	Worked as an **Anna Centenary Research Fellow in the Department of ECE** for a period of **36 months** from 22.1.2012 to 31.12.2014.
S.K.P. Engineering College, Tiruvannamalai- 606611, Tamilnadu, India	Worked as an **Assistant Professor in the Department of ECE** for a period of **21 months** from 15.2.2010 to 20.1.2012.
Saraswathi Velu College of Engineering, Sholinghur-631102, Tamilnadu, India.	Worked as a **Lecturer in the Department of ECE** for a period of **8 months** from 28.8.2006 to 3.5.2007.
CMOS Automation India Pvt. Limited, B14, 1st Floor, Ambattur Industrial Estate, Chennai-600058, Tamilnadu, India.	Worked as a **Junior Engineer-Systems** for a period of **14 months** from 6.6.2005 to 7.8.2006.

Total Experience: ***16 years and 4 months***

8. List of International Conferences Attended:

- Society for Pediatric Radiology, April 13-15, Miami, USA, 2024.
- AES 2020: A New Virtual Event from the American Epilepsy Society, December 4-8, USA, 2020.
- International Conference on Informatics, Electronics, and Vision (ICIEV), May 23-24, Dhaka, Bangladesh, 2014.
- INCF Neuroinformatics Congress, August 25-27, Leiden, The Netherlands, 2014.
- 36th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, August 26-30, Chicago, USA, 2014.

9. List of Fellowships/Awards/Grants received:

1. Received the prestigious “John Caffey Award for best scientific poster” for the year 2024 at the SPR conference, Miami, USA.
2. Selected as a “Anna Centenary Research Fellow” from Jan 2012 to December 2014 to pursue Ph.D. in Anna University Chennai.
3. Received INCF travel award to attend “INCF short course 2014” at Leiden, The Netherlands.
4. Received “2014 EMBC Student Travel Award” to attend EMBS international conference at Chicago, Illinois, USA.
5. Received the Best Student Written Paper Award (Co-author) at the 58th RMBS Bioengineering Symposium (2021, Virtual Conference, USA).

10. List of Project/Grant Proposals written and submitted for PI:

S. No	Project Title	Funding agency
1	Hippocampal dentation as an imaging biomarker to treat children and adults with temporal lobe epilepsy	Ramalingaswami Re-entry Fellowship (RRF), DBT, India.
2	Analysis of sub-anatomic changes associated with Alzheimer conditions using models and multi-modal imaging.	Cognitive Science Research Initiative (CSRI), India.
3	Investigations on the role of Amyloid proteins in cognitive disorders using computational fluid dynamics approach.	Cognitive Science Research Initiative (CSRI), India.
4	Development of image based patient specific models and intelligence systems for human brain simulator.	Information Technology Research Academy (ITRA), India.
5	Development of an Intelligent diagnostic system for multiple abnormalities using radiographic Mediastinum images.	Science and Engineering Research Board (SERB), India.

11. Educational Qualification:

Degree	Institution	Percentage of Marks	Graduation Year
Ph.D.	Anna University.	Specialization: Neuroimaging	2016
M.E (Applied Electronics)	Thanthai Periyar Govt. Institute of Technology, Vellore.	73.43%	2009
B.E (ECE)	SKP Engineering College, Tiruvannamalai.	70.33%	2005

11. Ph.D. Thesis Title- Analysis of brain ventricular shape changes in Alzheimer MR images using Reaction Diffusion Level Set.

12. Personal Information:

Full name:	Anandh Kilpattu Ramaniharan.
Father's Name:	Late. Mr. N. Ramaniharan (Former Thasildhar-Arani).
Gender:	Male.
Date of Birth:	11th August 1983.
Nationality:	Indian.
Languages known:	Tamil and English.
India Address:	Sri Seshadri Nivas, 572/B, Vallalar Street, Nehru Nagar, Vengikkal, Thiruvannamalai, Tamilnadu, India-606604.
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13. References:

1. Prof. Dr. S. Ramakrishnan, Professor, Biomedical division, Dept of Applied Mechanics, Indian Institute of Technology Madras, Chennai, India. Email: sramki@iitm.ac.in. Mobile: +91 9841093383.

2. Prof. Dr. C. M. Sujatha, Professor, Dept of ECE, CEG Campus, Anna University, Chennai. India. Email: sujathacm@annauniv.edu. Mobile: +91 9790831413.

3. Dr. Mary Kate Manhard, Assistant Professor, Department of Radiology, Cincinnati Children's Hospital Medical Center, Cincinnati, United States. Email: mary.manhard@cchmc.org. Mobile: +1 4232021120.

4. Dr. A. R. Jac Fredo, Associate Professor, School of Biomedical Engineering, Indian Institute of Technology BHU, Varanasi, India. Email: jack.bme@iitbhu.ac.in. Mobile: +91 9444555798.

5. Prof. Dr. Lawerence Ver Hoef, Professor, Epilepsy Division, Department of Neurology, University of Alabama at Birmingham, Birmingham, United States. Email: lverhoef@uabmc.edu, Mobile: +1 2054228808.

14. Declaration:

I hereby declare that the information furnished above is done to the best of my knowledge and belief.

Anandh Kilpattu Ramaniharan, Ph.D.