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Research Vision

“One of the Early Adopters of AI for Everyone” where my current research focuses on bridging the linguistic divide in AI by developing bias-aware, multimodal, multilingual, and multitask (M3) transformers. I aim to solve the low-resource multilingual AI scaling crisis through depth-first specialization, adversarial speaker traits disentanglement, and edge-ready deployment pipelines. By treating under-represented languages as first-class citizens rather than appendages to high resource language-centric backbones, my goal is to ensure equitable access to digital AI systems.

Technical Expertise

- **AI Specializations:** Multimodal Transformers, Speech Processing, Natural Language Representation and Processing, Transfer Learning, MLOps, PEFT.
 - **Programming & Tools:** Python, R, Matlab, Git, Docker.
 - **Cloud & Edge:** AWS, GCP, Arduino, Raspberry Pi, ONNX, TensorRT.
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Education

Kitami Institute of Technology | Hokkaido, Japan

Ph.D. Candidate, Information and Communication Engineering (Oct 2025 - Current)

- **Advisor:** [Dr. Michal Ptaszynski](#)
- **Research Focus:** M3LM-Indic: A Bias-Aware Multimodal, Multilingual, and Multitask Transformer for English and 22 Indian Languages.

Amrita Vishwa Vidyapeetham | Coimbatore, India

Master of Technology in Computational Engineering and Networks (2013 – 2015)

- **Thesis Advisor:** [Dr. Anand Kumar M](#)
- **Focus:** Natural Language Processing, Natural Language Representation

CSI College of Engineering | The Nilgiris, India

Bachelor of Engineering in Electronic and Communications Engineering (2009 – 2013)

Research & Professional Experience

Kitami Institute of Technology | Hokkaido, Japan

Doctoral Researcher (Oct 2025 - Present)

- Architecting a unified dual-modality encoder-decoder capable of sub-1-second decoding and eight-task multitask adapter routing across 22 Indian languages.
- Designing a para-linguistic, bias-aware pre-training pipeline for Speech Language Model with adversarial disentanglement to enforce demographic fairness across speaker and speech traits.

RBG.AI | Coimbatore, India

Head of Product Development (Aug 2020 - September 2025)

- Leading the R&D team in building a Machine Learning Service Stack (MLStack) utilizing state-of-the-art AI technologies.
- Structuring unstructured information from text, image, and voice data to solve complex business challenges across evolving industries.

Arnekt Solutions Pvt. Ltd. | Pune, India

Chief Technology Officer & R&D Product Manager (Mar 2018 - Jun 2020)

- Developed Cognitive Intelligence as a Service (CLaaS), a platform featuring microservice patterns for serving AI models (NLP, CV) to enterprise clients.
- Engineered a Conversational Agent Platform enabling SMEs to build conversational systems with reduced cognitive load.
- Built an end-to-end autonomous car ML platform utilizing imitation and reinforcement learning on simulation platforms like Carla and Airsim.

Amrita Vishwa Vidyapeetham | Coimbatore, India

Research Associate (Aug 2017 - Mar 2018)

- Developed AI solutions focusing on text representation for classification, information extraction from clinical/legal texts, and author profiling.

Accenture Innovation Center | Bangalore, India

Research Scientist Analyst - Team Lead (Dec 2016 – Jul 2017)

- Led a team automating internal purchase procedures using Machine Translation, Information Extraction, and OCR.

Tata Consultancy Services (AI Practice) | Cochin, India

AI Practitioner (Sep 2015 – Dec 2016)

- Developed reusable NLP and Computer Vision solutions, including text/image classification and OCR engines for the Healthcare and BFSI sectors.

Publications (From October 2025/PhD Enrollment)

Under Review / Preprints:

- **Barathi Ganesh HB**, Michal Ptaszynski, Reshma U, Jairam R, 2026. AURA-ST: Acoustic-Unconstrained Residual Architecture for Speech Translation. The International Conference on Spoken Language Translation (IWSLT), ACL 2026.
- **Barathi Ganesh HB**, Jairam R, Michal Ptaszynski, Reshma U, Jyothish Lal G, Premjith B, 2026. DisentangLID: A robust encoder with dynamic adapter for language identification. The Speaker and Language Recognition Workshop, Tidy Lang Odyssey 2026.
- **Barathi Ganesh HB**, Michal Ptaszynski, Reshma U, Jairam R. "A Systematic Survey of Modality Fusion Strategies in Multimodal Multilingual Multitask Speech-Text Transformers." International Journal on Multi-Sensor, Multi-Source Information Fusion (2026).
- **Barathi Ganesh HB**, and Michal Ptaszynski, 2025. Multilingual Transformers in Code-Mixed Speech and Text: A Survey Across Core NLP Tasks. ACM Computing Surveys.

Published:

- Jairam R, Premjith B, and **Barathi Ganesh HB**. WhispAdapt: Multilingual dialect recognition in low-resource Dravidian languages. Array. 2025 Dec 2:100629.
- **Barathi Ganesh HB**, and Michal Ptaszynski. RBG-AI: Benefits of Multilingual Language Models for Low-Resource Languages. In Proceedings of the Tenth Conference on Machine Translation, pp. 1233-1239. 2025.
- **Barathi Ganesh HB**, Michal Ptaszynski, Rene Melendez, and Juuso Eronen. KIT-TIP-NLP at MultiPride: Continual Learning with Multilingual Foundation Model. (EVALITA2026).

Open Source & Community Leadership

Data & Infrastructure Initiatives:

- **M3LM-Indic Corpus (Ongoing):** Developing a 50K+ hour open corpus covering 23 languages, complete with emotion annotations and gender balancing, utilizing weak supervision for low-resource languages.

- **CoRePool** - Corpus for Resource Poor Languages: 420 min of monolingual supervised corpus and 1K hours of multilingual unsupervised corpus for the Badaga language from the Dravidian language family. The annotation of supervised corpus helps in performing speech-to-text, text-to-speech, translation, gender, and speaker identification.
- **Shared Task Infrastructure:** Spearheading the release of open-source models and proposing international shared tasks to attract global collaboration on Indic languages.

Organized International Workshops & Shared Tasks:

- **Advisory Committee / Organizer:** “Indian Native Language Identification (INLI)” at FIRE-2017 & FIRE-2018.
- **Organizer:** “Information Extractor for Conversational Systems in Indian Languages (IECSIL 2018)”, FIRE-2018.
- **Committee Member:**
 - “Detecting Paraphrases in Indian Languages (DPIL)”, FIRE-2016.
 - “Machine Translation system in Indian Languages (MTIL)”
- **Workshop Organizer:**
 - DeepChem - Deep Learning & NLP for Computational Chemistry, Biology & Nano-materials
 - A Refresher experiential course on linear algebra and Optimization for Most Modern Signal processing and pattern classification.
 - DeepSci - Deep Learning for Healthcare and Financial Data Analytics.
 - AISec: Modern Artificial Intelligence (AI) and Natural Language Processing (NLP) Techniques for Cyber Security

Shared Tasks Participations:

- FIRE, #Micropost2015 NEEL, SemEval, IWSPA-AP, PAN-CLEF, SAIL, CDMC, SMM4H, WMT, IWSLT, InterSpeech, EVALITA, TidyLang
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