Badri Narayanan Murali Krishnan

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Education

University of Wisconsin-Madison **Sep 2023 – May 2025 (Expected)**
Master of Science - Computer Sciences *Madison, WI*
Courses: Artificial Neural Networks, Artificial Intelligence.

Sri Sivasubramaniya Nadar College of Engineering (Autonomous) **Aug 2018 – May 2022**
Affiliated to Anna University *Chennai, India*
B.Tech in Information Technology **CGPA: 8.955 / 10.00**
Graduated First Class with Distinction.
Courses: Machine Learning, Artificial Intelligence, Probability, Statistics, Data Structures and Algorithms.

Skills

Programming Languages: Python, C, C++
Frameworks and Tools: PyTorch, TensorFlow, Keras, Git, Docker, AWS
Libraries: NumPy, pandas, scikit-learn, NLTK, spaCy, OpenCV

Work Experience

Independent Study **Sep 2023 – Present**
Univeristy of Wisconsin-Madison *Madison, WI*
→ Working on a machine learning approach to mini localization problem.
→ Creating a customized trajectory prediction engine based on historic and current user data.
Advisor: Dr. Suman Banerjee - David J. DeWitt Professor

Associate Engineer - AI/ML **Jul 2022 – Jul 2023 (1 Yr)**
Qualcomm *Hyderabad, India*
→ Contributed towards the development and maintenance of SNPE (SnapDragon Neural Processing Engine).
→ Working to improve the testing pipelines for running deep neural networks on SnapDragon SoCs.
→ Introduced evaluation frameworks and metrics for ML models to enhance efficiency and accuracy.
Skills: Edge Machine Learning, Python, Docker
Advisor: Mrs. Archana Patil, Engineer - Staff / Manager

Machine Learning Intern **Mar 2021 – Jun 2022 (1 Yr 4 Mos)**
Mad Street Den (Vue.ai) *Chennai, India*
→ Developed a tool for document processing as part of the NLP core group using an OCR engine, image processing, and NLP techniques to process unstructured data and convert them to a structured format.
→ Built Computer Vision models to serve educational recommendations.
Skills: *NLP, CV, Python, PyTorch, Tensorflow, NumPy, pandas, scikit-learn, NLTK, spaCy, OpenCV, AWS*
Advisor: Mr. Anand Chandrasekharan, Founder and CTO

Part-Time Undergraduate Research and Teaching Assistant **Feb 2020 – Dec 2022 (2 Yrs 11 Mos)**
Bright Academy (Previously Solarillion Foundation) *Chennai, India*
→ Collaborated on Terms of Service Classification, an NLP problem statement that uses a two-stage knowledge distillation DL approach on low-resource devices with cutting-edge architectures like BERT to find unfair Terms of Service terms.
→ Lead the NLP group that presented the "Sign Language Translation using Multi Context Transformer" paper at the 20^{th} *Mexican International Conference on Artificial Intelligence (MICAI)*, Mexico City, 2021.
→ To translate the input sign video, Multi Context Transformer architecture employs transformers and runs on batched video inputs. Our model achieved comparable results with the state-of-the-art model while reducing the parameters significantly to enable the model deployment in more accessible devices.
→ Guided 5+ students in research, evaluated assignments and projects in Python and Machine Learning.
→ Oversaw the website development and managed the server for our research group.
→ Wrote bots for posting office hours and creating polls.
Skills: Research, NLP, CV, PyTorch, Tensorflow, NumPy, pandas, scikit-learn, NLTK, spaCy, OpenCV
Advisor: Mr. Vineeth Vijayaraghavan, Director - Research and Outreach

Student Researcher **Dec 2020 – Apr 2022 (1 Yr 5 Mos)**
Sri Sivasubramaniya Nadar College of Engineering *Chennai, India*
→ Introduced a novel architecture for Fake News Detection based on Transformer architecture, which considers the title and content of a news article to determine its integrity. Our work was accepted for publication in the Science Citation Index Expanded journal: *IOS Press - Journal of Intelligent & Fuzzy Systems, 2023.*
→ Developed a robust and cost-effective automatic speech recognition model for Tamil language leveraging Baidu's Deep Speech architecture. Our work was published in the Science Citation Index Expanded journal: *Intelligent Automation & Soft Computing*, 2022.
Skills: Research, NLP, Speech Signal Processing, PyTorch, Tensorflow, NumPy, pandas, scikit-learn, NLTK, spaCy
Advisor: Dr. Shahina A - Professor & Dr. Gayathri K S - Assistant Professor, Department of IT

Publications

Fake News Detection using a Deep Learning Transformer Based Encoder-Decoder architecture
Paper **Code**
M Badri Narayanan, *Arun Kumar Ramesh, Gayathri K S, Shahina A*
IOS Press - Journal of Intelligent & Fuzzy Systems, 2023
Journal indexed in Science Citation Index Expanded.

End-to-End Speech Recognition of Tamil Language **Paper** **Code**
Mohamed Hashim Changrampadi, A Shahina, ***M Badri Narayanan****, A Nayeemulla Khan*
Intelligent Automation and Soft Computing, 2021
Journal indexed in Science Citation Index Expanded.

Sign Language Translation using Multi Context Transformer **Paper** **Code**
M Badri Narayanan*, K Mahesh Bharadwaj, G R Nithin, Dhiganth Rao Padamnoor, Vineeth Vijayaraghavan*
20^{th} *Mexican International Conference on Artificial Intelligence (MICAI), Mexico City, 2021*
Paper published in Springer Lecture Notes in Artificial Intelligence (LNAI) proceedings.
Won the 3rd best paper award.

Academic Projects

Terms of Service Classification **Code** **Jun 2022 - Dec 2022**
Identify unfair Terms of Service clauses using a two-stage knowledge distillation DL algorithm on devices with minimal resources using state-of-the-art architectures like BERT.

Freelance Projects **Oct 2020 – Feb 2021**
Undertook projects from Freelancer.com in Natural Language Processing and Computer Vision. Completed a project with a US-based company "EasyComtec" to predict the ICD diagnosis code given a doctor report using Transformer architecture.

Clickbait Classification **Code** **Aug 2020**
Classifying clickbaits: articles with potentially misleading titles, using a state-of-the-art NLP architecture.

Object Detection Using YOLO v3 **Code** **Aug 2020**
Detecting everyday objects using the YOLO v3 network with a custom dataset.

Volunteering and Responsibilities

→ Reviewed manuscripts for the Science Citation Indexed Journal: IOS Press - Journal of Intelligent & Fuzzy Systems.

→ Conducted classes in NLP and CV, evaluated ML and DL assignments as the ML head of PROCODE - the official coding club of Department of Information Technology.

→ Served as the class representative for the entire duration of my undergraduate study.

→ Volunteered with Chennai Volunteers to teach spoken English classes for socio-economically weaker students.

Awards and Honours

→ Awarded the **Merit Scholarship** for my academic performance in the 3rd year of my undergraduate study.

→ Won the **3rd best paper** award for "**Sign Language Translation using Multi Context Transformer**" at the 20^{th} Mexican International Conference on Artificial Intelligence (MICAI), 2021.