# Varun **Gumma**

## SCAI Center Fellow | Microsoft Research

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## Education

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| **June 2023**<br>**Aug 2021** | **Indian Institute of Technology (IIT), Madras**<br>M.Tech. in Computer Science & Engineering<br>**CGPA:** 9.62/10<br>**Dept Rank:** 3<br>**Teaching Exp:** Pattern Recognition & Machine Learning, Linear Algebra & Random Processes, Fundamentals of Deep Learning | **Chennai, India** |
| **Jun 2021**<br>**Aug 2017** | **Birla Institute of Technology and Science (BITS), Pilani**<br>B.E. in Computer Science & Engineering with Minor in Physics<br>**CGPA:** 9.14/10<br>**Teaching Exp:** Introductory Physics, Computer Programming, Discrete mathematics, Data Structures & Algorithms, Foundations of Data Science, Machine Learning | **Hyderabad, India** |

## Experience

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| **Present**<br>**July 2023** | **Microsoft Research** [⊕]<br>*SCAI Center Fellow | Advisor: Dr. Kalika Bali*<br>Working on multi-dimensional evaluation of Large Language Models and building Machine Translation systems for low-resource languages. | **Banglore, India** |
| **July 2023**<br>**May 2023** | **Microsoft Research** [⊕]<br>*Research Intern | Advisor: Dr. Sunayana Sitaram*<br>Worked on multi-dimensional modular debiasing of Pre-trained Language Models such as BERT and RoBERTa. | **Banglore, India** |
| **May 2023**<br>**Aug 2022** | **Indian Institute of Technology, Madras | AI4Bharat** [⊕]<br>*Graduate Research | Advisors: Dr. Raj Dabre, Prof. Mitesh Khapra*<br>Working on understanding the effects of Knowledge Distillation on Multilingual Neural Machine Translation models, specifically for Indian languages. | **Chennai, India** |
| **Jul 2022**<br>**Jun 2022** | **National University of Singapore** [⊕]<br>*Visiting Research Scholar | Advisor: Dr. Aditya Karanam*<br>Worked on developing Machine Learning and Deep Learning models to extract *suggestions* and identify *suggested-features* from noisy user comments using Name-Entity-Recognition. | **Kent Ridge, Singapore** |
| **May 2021**<br>**Jan 2021** | **Birla Institute of Technology and Sciences, Pilani** [⊕]<br>*Undergraduate Research | Advisor: Prof. N.L. Bhanu Murthy*<br>Worked on developing a Deep Learning model to automatically generate comments for Java code snippets. | **Hyderabad, India** |
| **May 2021**<br>**Jan 2021** | **Birla Institute of Technology and Sciences, Pilani** [⊕]<br>*Undergraduate Research | Advisor: Prof. Barsha Mitra*<br>Worked on analyzing the performance of various Machine Learning models on ABAC datasets for *Policy Generalization & Augmentation*. | **Hyderabad, India** |
| **May 2020**<br>**Jan 2020** | **Birla Institute of Technology and Sciences, Pilani** [⊕]<br>*Undergraduate Research | Advisor: Prof. N.L. Bhanu Murthy*<br>Worked on fine-tuning BERT for Name-Entity-Recognition in Telugu. | **Hyderabad, India** |
| **July 2019**<br>**May 2019** | **Defense Research & Development Organization-Research Centre Imarat** [⊕]<br>*Student Intern*<br>Worked on building an Object Detection Model to identify cars in a given image. | **Hyderabad, India** |

## Publications

**[C.6]** **METAL: Towards Multilingual Meta-Evaluation**
Rishav Hada*, Varun Gumma*, Maxamed Axmed, Kalika Bali, Sunayana Sitaram
*Findings of the Association for Computational Linguistics: NAACL 2024* **[NAACL '24]**

**[C.5]** **MEGAVERSE: Benchmarking Large Language Models Across Languages, Modalities, Models and Tasks**
Sanchit Ahuja, Divyanshu Aggarwal, Varun Gumma, Ishaan Watts, Ashutosh Sathe, Millicent Ochieng, Rishav Hada, Prachi Jain, Maxamed Axmed, Kalika Bali, Sunayana Sitaram
*2024 Annual Conference of the North American Chapter of the Association for Computational Linguistics - Human Language Technologies (NAACL-HLT)* **[NAACL '24]**

**[W.1]** **MunTTS: A Text-to-Speech System for Mundari**
Varun Gumma, Rishav Hada, Aditya Yadavalli, Pamir Gogoi, Ishani Mondal, Vivek Seshadri, Kalika Bali
$7^{th}$ *Workshop on Computational Methods for Endangered Languages* **[ComputEL'24]**

**[C.4]** **MAFIA: Multi-Adapter Fused Inclusive LanguAge Models**
Prachi Jain*, Ashutosh Sathe*, Varun Gumma, Kabir Ahuja, Sunayana Sitaram
$18^{th}$ *Conference of the European Chapter of the Association for Computational Linguistics* **[EACL'24]**

**[C.3]** **Are Large Language Model-based Evaluators the Solution to Scaling Up Multilingual Evaluation?**
Rishav Hada, Varun Gumma, Adrian de Wynter, Harshita Diddee, Moxamed Axmed, Monojit Choudhury, Kalika Bali, Sunayana Sitaram
*Findings of the Association for Computational Linguistics: EACL 2024* **[EACL'24]**

**[J.1]** **IndicTrans2: Towards High-Quality and Accessible Machine Translation Models for all 22 Scheduled Indian Languages**
Jay Gala*, Pranjal A. Chitale*, Raghavan AK, Varun Gumma, Sumanth Doddapaneni, Aswanth Kumar, Janki Nawale, Anupama Sujatha, Ratish Puduppully, Vivek Raghavan, Pratyush Kumar, Mitesh M. Khapra, Raj Dabre, Anoop Kunchukuttan
*Transactions of Machine Learning Research* **[TMLR'23]**

**[C.2]** **An Empirical Study of Leveraging Knowledge Distillation for Compressing Multilingual Neural Machine Translation Models**
Varun Gumma, Raj Dabre, Pratyush Kumar
$24^{th}$ *Conference of the European Association of Machine Translation* **[EAMT'23]**

**[C.1]** **PAMMELA: Policy Administration Methodology using Machine Learning**
Varun Gumma, Barsha Mitra, Soumyadeep Dey, Pratik Shashikantbhai Patel*, Sourabh Suman*, Saptarshi Das, Jaideep Vaidya
$19^{th}$ *International Conference on Security and Cryptography - SECRYPT* **[SECRYPT'22]**

## Relevant Coursework

**M.Tech.** Advanced Data Structures & Algorithms, Pattern Recognition & Machine Learning, Fundamentals of Deep Learning, Natural Language Processing, Reinforcement Learning, Linear Programming & Combinatorial Optimization

**B.E.** Software Engineering, Foundations of Data Science, Machine Learning, Deep Learning, Quantum Information and Computing

## Skills

**Programming Languages:** Python, Java, C++, C, SQL, LaTeX
**Libraries & Frameworks:** HuggingFace Transformers, Fairseq, PyTorch-Lightning, PyTorch, TensorFlow, Scikit-Learn, Weights & Biases, Unix, GIT

## Academic Service

**Peer Reviewer** EMNLP'23, EACL'24, NAACL'24

## Awards and Achievements

**IIT Madras STAR TA, 2021-2023** For outstanding contributions as a Graduate Teaching Assistant

**GATE CS&IT, 2021** Secured an All India Rank of 159 with a score of 816/1000

**BITS Merit Scholarship, 2018** For meritorious academic performance in the year 2017-2018

# References

> Dr. Kalika Bali ....................................................... *Principal Researcher, Microsoft Research, India* [🌐]

> Dr. Sunayana Sitaram ............................................. *Principal Researcher, Microsoft Research, India* [🌐]

> Dr. Raj Dabre .......................................... *Adjunct Faculty, IIT Madras; Researcher, NICT, Japan* [🌐]

> Prof. Mitesh Khapra ................................................... *Associate Professor, IIT Madras, Chennai* [🌐]