

# Sagar Gubbi

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## Technical Interests

Language Models and Agents

## Education

2015 – 2021  
January                    March  
August                    July  
**Ph.D. Electrical and Communication Engineering,**  
*Indian Institute Of Science, Bangalore, India.*  
*Advisor: Prof. Bharadwaj Amrutur*

2011 – 2013  
August                    July  
**M.E. Electrical and Communication Engineering,**  
*Indian Institute Of Science, Bangalore, India.*  
*GPA 7.5/8 (Rank 1)*

2007 – 2011  
September                June  
**B.E. Electronics and Communication Engineering,**  
*Sri Jayachamarajendra College of Engineering, Mysore, India.*  
*GPA 9.8/10 (Rank 1)*

## Employment

2024 – now  
May  
**Research Engineer,**  
*Google DeepMind.*  
Gemini tool-use and agents.

2021 – 2024  
August                    May  
**Postdoctoral Researcher,**  
*Google Research,*  
*Host: Dr. Partha Talukdar.*

2021 – 2021  
April                    August  
**Consultant,**  
*ARTPark.*

2013 – 2014  
August                    December  
**Technical Associate,**  
*Robert Bosch Centre for Cyber-Physical Systems.*

## Publications

A. Davani\*, S. Gubbi\*, S. Dev, S. Dave, V. Prabhakaran, “**GeniL: A Multilingual Dataset on Generalizing Language**,” *Conference on Language Modeling*, 2024 (Oral spotlight).

S. Gubbi, P. Talukdar, and S. Narayanan, “**UGIF-Dataset: A New Dataset for Cross-lingual, Cross-modal Sequential actions on the UI**,” *Findings of the North American Chapter of the Association for Computational Linguistics*, 2024.

S. Gubbi, R. Upadrashta, and B. Amrutur, “**Translating Natural Language Instructions to Computer Programs for Robot Manipulation**,” *IEEE International Conference on Intelligent Robots and Systems*, 2021.

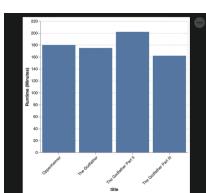
S. Gubbi, A. Biswas, R. Upadrashta, V. Srinivasan, P. Talukdar, and B. Amrutur, “**Spatial Reasoning from Natural Language Instructions for Robot Manipulation**,” *IEEE International Conference on Robotics and Automation*, 2021.

- S. Gubbi, R. Upadrashta, S. Kolathaya, and B. Amrutur, “**Multi-Instance Aware Localization for End-to-End Imitation Learning**,” *IEEE International Conference on Intelligent Robots and Systems*, 2020.
- S. Gubbi, R. Upadrashta, S. Kolathaya, and B. Amrutur, “**Teaching Robots Novel Objects by Pointing at Them**,” *IEEE International Conference on Robot and Human Interactive Communication*, 2020.
- S. Tirumala, S. Gubbi, K. Paigwar, A. Sagi, A. Joglekar, S. Bhatnagar, A. Ghosal, B. Amrutur, and S. Kolathaya, “**Learning Stable Manoeuvres in Quadruped Robots from Expert Demonstrations**,” *IEEE International Conference on Robot and Human Interactive Communication*, 2020.
- S. Gubbi\*, S. Kolathaya\*, and B. Amrutur, “**Imitation Learning for High Precision Peg-in-Hole Tasks**,” *IEEE International Conference on Control, Automation and Robotics*, 2020.
- S. Gubbi and B. Amrutur, “**One-Shot Object Localization Using Learnt Visual Cues via Siamese Networks**,” *IEEE International Conference on Intelligent Robots and Systems*, 2019.
- S. Gubbi and B. Amrutur, “**Scene text detection for augmented reality: character bigram approach to reduce false positive rate**,” *CSI Transactions on ICT*, 2018.
- S. Gubbi, A. Gupta and C. S. Seelamantula, “**How much can a Gaussian smoother denoise?**,” *Proceedings of the Tenth Indian Conference on Computer Vision, Graphics and Image Processing*, 2016.
- S. Gubbi and B. Amrutur, “**Adaptive Pulse Width Control and Sampling for Low Power Pulse Oximetry**,” *IEEE Transactions on Biomedical Circuits and Systems*, 2015.
- S. Gubbi and B. Amrutur, “**All Digital Energy Sensing for Minimum Energy Tracking**,” *IEEE Transactions on VLSI Systems*, 2015.
- H. Rao, D. Saxena, S. Kumar, S. Gubbi, B. Amrutur, P. Mony, P. Thankchan, K. Shankar, S. Rao and S. R. Bhat, “**Low power remote neonatal temperature monitoring device**,” *BIOVICES, 7th International Conference on Biomedical Electronics and Systems*, 2014.

## Patents

- D. Ghosal, P. Jain, S. Gubbi, A. Raghuveer, S. Pradeep Kumar, “**Non Parametric Tool Use with Frozen LLMs**,” *Patent Pending (2025)*.
- S. Gubbi, B. Amrutur, “**Low Power Pulse Oximeter and Method A Thereof**,” *India Patent 382658 (2014)*.

## Selected Projects



### **Gemini 2.0 Tool-Use – Search, Analyze, Plot Agent (2024)**

Gemini 2.0 was trained to use tools like Google Search and code execution in addition to custom third-party functions via function calling. It can be used to search the web, analyze gathered data in Python, and create a plot using libraries such as Altair.

<https://developers.googleblog.com/en/the-next-chapter-of-the-gemini-era-for-developers/>

<https://youtu.be/EVzeutiojWs?t=8>



### UI Grounded Instruction Following for educating Novice Users (2022)

Novice Internet Users tend to use only basic phone features like calling and messaging. UGIF shows users how to use the phone by using a large language model to transform FAQ pages to step-by-step demonstrations overlaid on the UI.

<https://github.com/google-research/google-research/tree/master/ugif>



### Natural language instructions to code for robot manipulation (2020)

A machine translation model generates a program which queries the scene by accessing the output of the object detector and controls the robot to accomplish the specified task.

<https://www.youtube.com/watch?v=usCvsDIgWOM>

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## Awards and Academic Honors

- IBM Watson Student Showcase competition, 2015 (my project on predicting if a StackOverflow question is fact/opinion based was among the top 5 cognitive apps submitted to the competition).
- Visveswaraya PhD fellowship, 2015-2020 (awarded by MeitY, Government of India to PhD students in the areas of Electronics System Design and IT enabled services).
- Indian Institute Of Science Alumni Medal for academic achievement, 2013 (awarded to the first rank holder in the M.E. Microelectronics stream).
- Winner of the Cadence Design Contest, 2013 (my design was placed first among 133 entries from 45 academic institutions across India).
- Ministry of Human Resource Development Graduate research scholarship, 2011-2013.
- B.S. Keshav Kishan Memorial Endowment Medal for academic achievement, 2011 (awarded to the first rank holder in the B.E. Electronics and Communications stream).
- All India Rank 3 in GATE 2011 (Graduate Aptitude Test for Engineering is taken by over 100,000 engineering graduates in India to get into graduate schools).
- Rank 2 in K-CET 2007 (Karnataka Common Entrance Test is taken by over 40,000 high school students in the state of Karnataka to enter professional undergraduate programs).

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## Selected Press

- **Times Of India** (2015): “IISc researchers devise all-digital circuits.” Aparajita Ray, *Times Of India*, May 18, 2015.
- **Indian Express** (2015): “Running out of smartphone battery? A new digital circuit could fix all of that.” Amitabh Sinha, *Indian Express*, June 7, 2015.
- **Education Times** (2015): “The digital sous chef.” Rahat Bano, *Education Times*, Jan 19, 2015.

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## References

Available upon request.