VIKRAM SINGH

(+91) xxxxx-xxxxx ◇ Bangalore, India

vikramsinghanttal@gmail.com ◇ vikramsi ◇ vikramsinghanttal.com ◇ vikramsinghanttal

EDUCATION

Indian Institute of Technology, Kanpur | **CPI**: 9.25 (*Award for Academic Excellence*) **2016 - 2018**
Master of Technology in Signal Processing and Communication,
***Advisor**: Aditya Jagannatham, Dept. of Electrial Engineering,*
***Thesis**: Adaptive Schemes for Spatio-Temporally Correlated Multiuser Massive MIMO Channel Estimation.*

SKILLS

Programming Languages	C, C++, Python, MATLAB, Java, JavaScript.
Software Frameworks	Qt (C++, Python), NodeJS
Documentation Tools	Sphinx, Doxygen, LaTeX, Markdown, reStructuredText
Hardware Development	SDRs, Raspberry-Pi 4, Arduino, Micro-controllers.
VCS and Cloud Tools	GitHub, GitLab, Kubernetes, Docker
Scalable Computing Tools	CUDA-C/C++, Sionna, 5G-Toolkit, TensorFlow, Keras
AI Assisted Coding Tools	GitHub Copilot, OpenAI Codex, Google Antigravity.

EXPERIENCE

Staff Research Engineer **April 2026** onwards
Lead Research Engineer **Aug 2024** till **March 2026**
Tejas Networks *Bangalore*

- Lead efforts for filing **SEP**s and Technical Contributions to R-19 and R-20 of 3GPP on:
  - ISAC Evaluations and Aspects of Integration with Communication (**R20-6GR/10.8.1/2**),
  - ISAC channel modelling (**R19/9.7**) and RAN Enhancement (**R20-NR/10.5**),
  - **AI-ML** for Beam Management (**R19/9.1.1**) and Positioning Enhancements (**R19/9.1.2**).
- Lead the 5G/6G networks **Algorithms Development** and **System Simulation** team.
  - Python based GPU accelerated development of all **Physical layer** & **MAC-Schedule**r Algorithms.
  - Performed System Simulation to demonstrate 5G-NR product performance to **Global Clients**.
  - Developed algorithms and AI/ML models, conducted SLS, contributed to 3GPP R-19/R-20, filed patents, and published papers on:
    * gNB Mono-static and Bi-static Sensing for 3GPP RAN1 R-20,
    * AI-ML for Beam-management and Positioning in 3GPP RAN1 R-19,
    * AI-ML based Angle-Time positioning for upcoming releases of 3GPP.

Founder and Chief of Technology **Dec 2021 - July 2024**
Gigayasa Wireless *IIT Madras Research Park, Chennai*

- Built a python based **System Simulations** tool called **5G Toolkit** from scratch.
- Lead Research and Development on 3GPP Release-18 study on "**AI/ML for NR Air Interface**".
- Developed all the 3GPP standards-compliant Physical Layer and MAC scheduler algorithms for gNB/UE.

Senior Research Engineer **Nov 2018 - Dec 2021**
Center of Excellence in Wireless Technology, IIT Madras *Chennai, India*

- Wrote the Technical Contributions for R-16, R-17 of 3GPP on Positioning Enhancements in 5G Networks
- Researched and Developed positioning algorithms to meet 20 cm position accuracy targets in 5G system.
- Initiated the ground work on **AI-ML for physical layer** and demonstrated link/system-level results on:
  - **High resolution Spatio-temporal channel estimation** using SRCNN + DnCNN,
  - AI-ML models based **Spatial CSI Prediction** for Positioning, DL Precoding & carrier aggregation.

System on Chip Design Engineer **Jun 2018 - Oct 2018**
Intel India *Bangalore, India*

- Designed and maintained **PARPSF** block for Scalable Performance CPU Development Group (SDG).

EXPERTISE

- 5G-NR Physical layer 3GPP Standards
- Physical layer and Scheduler Algorithm Design for Cellular Networks
- Prototyping using Software Defined Radios
- CUDA/Keras based GPU Scalable Algorithms/Simulation Software Design
- Artificial Intelligence model design for RAN.

COURSE CURRICULUM

Fundamentals of Wireless Communications, Detection & Estimation Theory, Adaptive Signal Processing, Game Theory, Representation & Analysis of Random Signals, Topics in Stochastic Processes, Digital Communication Networks, Convex Optimization, Queuing Theory, Probabilistic Machine Learning, Deep Learning, Reinforcement Learning, (MIT 6.S894) Accelerated Computing, (Stanford-CS146S) The Modern Software Developer.

PUBLICATIONS

1. **Vikram Singh**, S. Srivastava and A. K. Jagannatham, "Superimposed Pilots based Adaptive Time-Selective Channel Estimation in MU-MIMO Systems," 2020 National Conference on Communications (NCC), Kharagpur, India, 2020, pp. 1-6, doi: 10.1109/NCC48643.2020.9056088.
2. **Vikram Singh**, A. A. Masal, J. Klutto Milleth and B. Ramamurthi, "High Precision Positioning using Multi-cell Massive MIMO system for 5G and beyond," 2021 IEEE 32nd Annual International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC), Helsinki, Finland, 2021, pp. 1234-1240, doi: 10.1109/PIMRC50174.2021.9569480.
3. Abhijeet Abhimanyu Masal, **Vikram Singh**, Radhakrishna Ganti and, J. Klutto Milleth, (Best paper 2nd Runner-up Award) "Low Complexity Position Estimator for DL-AoD and UL-AoA for B5G and 6G Networks," accepted for publication in 2024 IEEE 35th Annual International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC), 2–5 September 2024 Valencia, Spain.
4. Rahul Pal, **Vikram Singh**, and Vijay Mareedu, "Performance Evaluation of AI-based CSI Feedback Techniques for 5G Advance and 6G Networks" DOI: 10.36227/techrxiv.172927298.82215493/v3 has been accepted on Aug-03/2025 for publication in Physical Communication Journal.
5. Adarsh Ravi, Divyansh Gupta, **Vikram Singh**, and Preetam Kumar, SuperConvNet: Super Resolution Orchestrated Deep Convolutional Neural Network for Spatial Beam Prediction in B5G and 6G Systems manuscript ID TMLCN-06-26-0176 has been submitted to IEEE Transactions on Machine Learning in Communications and Networking.
6. Rahul Pal, **Vikram Singh**, and Shikha Maurya PrecoderNet: AI-ML based Feedback Framework for Massive MIMO-OFDM Systems has been accepted for publications/presentation in 2026 18th International Conference on COMmunication Systems and NETworks (COMSNETS).

7. Aditya Gupta, **Vikram Singh**, and Preetam Kumar, PosNet: A CNN-based Transformer model for UE localization in NLOS dominated scenarios manuscript ID WCL2026-2890 has been submitted to IEEE Communications Letters.

8. Alok Singh, **Vikram Singh**, Aditya Gupta, and Preetam Kumar, ToANet: Transformer based Model for AI-ML Assisted Positioning has been submitted to 32^{nd} National Conference on Communications (NCC) 2026.

9. **Vikram Singh**, Abhijeet Abhimanyu Masal, and RadhaKrishan Ganti PosBeamNet: AI-ML Model for Position Assisted Downlink Beam Prediction has been submitted to 32^{nd} National Conference on Communications (NCC) 2026.

10. Abhijeet Abhimanyu Masal, **Vikram Singh**, Radhakrishna Ganti and, J. Klutto Milleth, "Low Complexity Hybrid mRTT-AoA based Precise Positioning for B5G and 6G Networks" draft has been prepared and is being streamlined for submission.

11. **Vikram Singh**, Abhijeet Masal, Jishnu P, Jishnu A, Klutto Milleth, "Artificial Intelligence and Machine Learning for Positioning Enhancement in 5G Networks" draft has been prepared and is being streamlined for submission.

12. A Ravi, **Vikram. Singh** and P. Kumar, "Super-resolution Based Channel Estimation for PBCH Data Decoding in 5G NR System," manuscript ID is ISJ-RE-22-15236 submitted to IEEE Systems Journal.

13. A Ravi, **V. Singh** and P. Kumar, "Position as a measurement in 6G Networks," draft has been prepared and is being streamlined for submission.

14. A Ravi, Divyansh Gupta, Pranesh Priyanshu, **Vikram. Singh** and P. Kumar, "SwitchConvNet: Deep Learning Framework for Mobility-Aware Spatial Beam Prediction in Beyond 5G and 6G Systems" Manuscript ID VT-2025-05392.R2 accepted for publication to IEEE Transactions on Vehicular Technology.

15. Vamsi Krishna Peketi, Rahul Pal, **Vikram. Singh**, and Salija P, "Performance Analysis of UAV Sensing using ISAC-enabled 5G-Advanced and 6G Networks" Manuscript ID #1571320444 submitted for publication to 2026 IEEE International Conference on Advanced Networks and Telecommunications Systems (ANTS).

16. **Vikram Singh**, Salija P, Vamsi Krishna Peketi, and Rahul Pal, "Low Complexity GDoP Robust Measurement Subset Selection Technique for Accurate Target Localization and Tracking for ISAC enabled 6G Networks" Manuscript ID VT-2025-05392.R2 accepted for publication to 2026 IEEE International Conference on Advanced Networks and Telecommunications Systems (ANTS).

17. Shubham Kukadiya, **Vikram Singh**, Abhishek Jindal, and Manish Kumar, "A Hybrid CNN-Transformer Framework for Precise Indoor Positioning in 6G Networks" published in IEEE International Mediterranean Conference on Communications and Networking (MeditCom) 2026.

18. Rahul Pal, **Vikram Singh**, and Shikha Maurya, "Unauthorized UAV Detection Using Bistatic MIMO-OFDM ISAC Under Static Clutter" submitted for publication in IEEE 19th International Conference on COMmunication Systems & NETworkS (COMSNETS) 2027.

PATENTS

1. Salija P, and **Vikram Singh**, "System and Method for Measurements and Reporting for Sensing-Assisted Communication in Integrated Sensing and Communication Networks", Patent Application No.: 202641097076 filed on Aug 14, 2026.

2. Salija P, and **Vikram Singh**, "Reference Signal Designation and Sensing Pattern Control for Integrated Sensing and Communication Systems", Patent Application No.: 202641080293 filed on June 29, 2026.

3. Salija P, and **Vikram Singh**, "Signaling and Procedures for Sensing-Assisted Communication in Integrated Sensing and Communication Systems", Patent Application No.: 202641098469 filed on June 05, 2026.

4. Upendra Patel, and **Vikram Singh**, "System and Method for Enhanced Data Channel Coding and Decoding for Wireless Communication System", Patent Application No.: 202641057789 filed on May 06, 2026.

5. Midde Sunil Kumar Shetty, Peketi Vamsi Krishna, Salija P., and **Vikram Singh**, "System and Method for Signaling and Procedures for Integrated Sensing and Communication (ISAC)", Patent Application No.: 202641057788 filed on May 06, 2026.

6. Nandan Kumar, and **Vikram Singh**, "Signalling and Protocols for Seam Aware Cross Slot Scheduling", Patent Application No.: 202641055468 filed on April 17, 2026.

7. Salija P., and **Vikram Singh**, "A Technique for Adaptive Sensing Data Reporting Architecture for Integrated Sensing and Communication (ISAC)", Patent Application No.: 202641038291 filed on March 27, 2026.

8. Gautam Kumar Rai., Venkata Sai Prasad, **Vikram Singh**, and Jishnu A. "Dedicated RACH preamble and new MAC PDU format for Random Access Response for FWA device in 4-step random access procedure", Patent Application No.: 202641006362 filed on Jan 24, 2026.

9. **Vikram Singh**, Aditya Gupta, Priya Roushni, Preetam Kumar, and Jishnu A, "AI-ML Models for Wireless Positioning Using Channel Information", Patent Application No.: 202541112619 filed on Nov 17, 2025.

10. **Vikram Singh**, Adarsh Ravi, Divyansh Gupta, and Preetam Kumar, "AI/ML-Based Downlink Beam Prediction for Enhanced 5G-Advanced and 6G Networks", Patent Application No.: 202541083874 filed on Sept 3, 2025.

11. Akshatha Nayak Manjeshwar, Narayan Pai Hosdur, and **Vikram Singh**, "Methods and systems for supporting gNB based sensing", Patent Application No.: 2025xxxxxxxx filed on Aug 15, 2025.

12. **Vikram Singh**, Vijay Kumar Mareedu, Sivan Ramachandran, and Jishnu A, "Enhanced Air Interface and Measurements for 6G Networks", Patent Application No.: 202541013162 filed on Feb 15, 2025.

13. **Vikram Singh**, Sivan Ramachandran, and Jishnu A, "Efficient Data Collection and Model Architecture for AI-ML-Based Positioning" Patent Application No.: 202541009543 filed on Feb 05, 2025.

14. Narayan Pai Hosdur, **Vikram Singh**, Akshatha Nayak Manjeshwar, and Jishnu A, "End-to-End Network System Architecture to Enable Sensing and Communication in Advanced Wireless Networks", Patent Application No.: 202541043573 filed on May 05, 2025.

15. **Vikram Singh**, Vijay Kumar Mareedu, Sivan Ramachandran, and Jishnu A, "Low Overhead AI-ML based Positioning Enhancements", Patent Application No.: 202441085443 filed on Oct 23, 2024.

16. **Vikram Singh**, Vijay Kumar Mareedu, Sivan Ramachandran, and Jishnu A, "AI-ML based Positioning Enhancements", Patent Application No.: 202441074530 filed on Oct 2, 2024.

17. **Vikram Singh**, Abhijeet Abhimanyu Masal, Jeniston Deviraj Klutto Milleth, Bhaskar Ramamurthi, "Method of Improving Accuracy of Positioning a Node in a Cellular Network", filed on March 06, 2021, US Patent Application Number: US20240429979A1.

18. **Vikram Singh**, Abhijeet Masal, Sunil Kaimalettu, JDK Milleth and Bhaskar Ramamurthi, "Low Overhead, Low latency and High Precision Positioning using Wireless Network", filed on March 06, 2021, Patent Application Number: 202141009458.

19. Priyanka Dey, Deepak PM, Abhijeet Masal, **Vikram Singh**, JDK Milleth and Bhaskar Ramamurthi, "Signalling Methods for a Network with Reconfigurable Intelligent Surface and Repeaters", filed on Oct 1, 2021, Patent Application Number: US20240429979A1.

20. **Vikram Singh**, Abhijeet Masal, Priyanka Dey, Sunil Kaimalettu, JDK Milleth, and Bhaskar Ramamurthi, "Method of Positioning a Node in a Cellular Network", Filing Date: April 03, 2022, Patent

Application Number: US20240196361A1.

21. Abhijeet Masal, **Vikram Singh**, Sayyed Shafivulla, Pavan Kalyan Devarakonda, JDK Milleth, and Bhaskar Ramamurthi, "Methods of Determining Position of a Target Node in Side-Link Communication System", Publication date: August 11, 2023, Patent Application No.: US20240089893A1.

22. Abhijeet Masal, Pavan Kalyan Devarakonda, **Vikram Singh**, JDK Milleth, and Bhaskar Ramamurthi, "System and Method of Positioning of a Target Node in Side-link Communication System", Publication date: March 10, 2023, Patent Application Number: US20230292278A1.

23. Anil Kumar, Abhijeet Masal, **Vikram Singh**, JDK Milleth, and Bhaskar Ramamurthi, "Method for Beam Management in Sidelink Communication", Publication date: Feb 7, 2023, Patent Application Number: US20230254025A1.