

CONTACT INFORMATION	5-4-78/H/2, APHB Colony, Bhongir, Telangana, India (IN)-508116.	<a href="https://pavanreddymanne.github.io">https://pavanreddymanne.github.io</a> <a href="mailto:pavanreddymanne@gmail.com">pavanreddymanne@gmail.com</a>
EDUCATION	<b>Ph.D. in Electrical Engineering</b> (advisor: Prof. Kiran Kuchi) <i>Indian Institute of Technology Hyderabad</i> Dissertation: "System-Level Modelling and Performance Enhancements for 4G/5G Systems" <a href="#">Received IEEE GraTE7 2022 Best Ph.D. Thesis Award</a>	[Dual Degree] 2014-2021
	<b>M.Tech. in Electrical Engineering</b> <i>Indian Institute of Technology Hyderabad</i>	[Dual Degree] 2014-2021
	<b>B.Tech. in Electronics and Communications Engineering</b> <i>ACE Engineering College</i> (affiliated to JNTU Hyderabad)	2014
RESEARCH AREAS	Signal processing for wireless communications; scheduler designs for cellular networks; massive MIMO and beam-forming; protocol design, system building, and evaluation; next-generation multiple access schemes; and reconfigurable intelligent surfaces.	
WORK EXPERIENCE	<b>Principal Architect, WiSig Networks</b> • Leading the layer-2 R&D team that is building standard compliant 5G base station "Bharath-RAN". <ul style="list-style-type: none"> <li>As a lead architect, I have designed a range of cutting-edge algorithms focused on scheduling, link &amp; rank adaptation, and power control for a 5G base station. Subsequently, I have been guiding my team in the implementation and outdoor evaluation of these designs.</li> </ul>	2023-present
	<b>Lead Engineer, WiSig Networks</b> • Researched and co-developed a new concept called structural MIMO that maximizes the cellular capacity and ensures ubiquitous coverage. <ul style="list-style-type: none"> <li>A part of our work was submitted to ITU as a potential technology for IMT 2030 or 6G standard. <a href="#">[Link]</a></li> </ul> • Patented various algorithms for coverage enhancement, power control, scheduling users, and resource allocation in 4G/5G systems. • Developed user pairing and beamforming algorithms for technologies like non-orthogonal multiple access schemes and reconfigurable intelligent surfaces, and published our findings in premier IEEE journals.	2020-2023
	<b>Research Engineer, WiSig Networks</b> • Developed a MATLAB based 4G and 5G standard-compliant commercial system-level simulator from scratch. • Patented beamforming algorithms that maximize 4G massive MIMO capacity. <ul style="list-style-type: none"> <li>With minimal software changes, our idea introduces 5G like beamforming feature to legacy 4G systems.</li> <li><a href="#">Received Best Paper Award Honorable Mention at COMSNETS 2020 for the work.</a></li> </ul> • Developed and evaluated a scheduler design that handles hundreds of users supporting single user MIMO (SU-MIMO) and multi-user MIMO (MU-MIMO). • Implemented physical layer downlink control channel for various cellular technologies: 5G-NR, 4G-LTE, NB-IoT, and LTE-M1.	2018-2020
ACADEMIC EXPERIENCE	<b>Thesis Co-Advisor for Ph.D. Students</b> <ul style="list-style-type: none"> <li>Spandan Bisoyi, <i>IIT Hyderabad</i>, Ongoing</li> </ul>	
	<b>Thesis Co-Advisor for M. Tech Students</b> <ul style="list-style-type: none"> <li>Kusuma Priya Pulavarty, <i>IIT Hyderabad</i>, 2022</li> <li>Swaraj Srivatsava, <i>IIT Hyderabad</i>, Ongoing</li> <li>Shivalika Tripathi, <i>IIT Hyderabad</i>, Ongoing</li> </ul>	

## Teaching Assistant

Indian Institute of Technology Hyderabad, India

- Assisted in teaching of Signals and Systems [under-graduate level]
- Assisted in teaching of Digital Signal Processing [under-graduate level]
- Assisted in teaching of Advanced Cellular Communications [post-graduate level]

AWARDS	IEEE GraTE7 Best Ph.D. Thesis Award, <i>IEEE</i>	2022
	Best Paper Award Honourable Mention, <i>COMSNETS</i>	2020
	Best Poster Award, <i>COMSNETS</i>	2023
	Excellence in Research Award, <i>IIT Hyderabad</i>	2020
	Excellence in Research Award, <i>IIT Hyderabad</i>	2018

SERVICE      Reviewer for: IEEE IoT-J, IEEE WCL, IEEE TVT, IEEE ICC, IEEE Globecom, IEEE WCNC.

## PATENT

### Granted Patents

## APPLICATIONS

2. Method for Allocating Resources to a Plurality of Users by a Base Station [\[Link\]](#).

1. Method for Wireless Communication Using Beamformed PDCCH [\[Link\]](#).

### Provisional Filed, Under Examination

9. Enhanced Rank Adaptation Methodology for Multiple-Input-Multiple-Output (MIMO) Systems.

8. Graph Neural Networks for User-Pairing in Wireless Communication Systems.

7. Structural Massive MIMO and Methods Thereof.

6. Method of communication with relay nodes and/or user equipment's and communication systems thereof.

5. A Method to Transmit One or More Waveforms to One or More Users.

4. High Capacity Wireless Backhaul and Methods Thereof.

3. A Method for Adaptive Multi-user Clustering in Non-orthogonal multiple access systems with Imperfect Successive Interference Cancellation.

2. Methods for Improving Coverage of a Cellular Network and thereof [\[Link\]](#).

1. Method and System for Scheduling a Pool of Resources to a Plurality of User Equipments [\[Link\]](#).

## RESEARCH

### Journals

## PUBLICATIONS

8. Spandan, Muralimohan, Harish, Pavan Reddy M., SaiDhiraj, K. Kuchi, "Massive MIMO with Circular Antenna Array: Design, Implementation, and Validation", *IEEE Access*, 2024, [\[Link\]](#).

7. S Mourya, Pavan Reddy M., SD Amuru, K. Kuchi, "Spectral Temporal Graph Neural Network for massive MIMO CSI Prediction", *IEEE Wireless Commun. Lett.*, 2024, [\[Link\]](#).

6. Pavan Reddy M. SaiDhiraj, and K Kuchi "Optimizing the Placement and Beamforming of RIS in Cellular Networks: A System-Level Modeling Perspective", *IEEE Commun. Lett.*, 2023, [\[Link\]](#).

5. Pavan Reddy M. and Abhinav Kumar "User Pairing and Power Allocation for IRS-Assisted NOMA Systems with Imperfect Phase Compensation", *IEEE Wireless Commun. Lett.*, 2022, [\[Link\]](#).

4. Pavan Reddy M., Koteswara Rao G., Harish Kumar D., Subhash K., S. Amuru, and K. Kuchi, "Uplink Coverage Enhancements for Extremely Large Cell Sites", *EURASIP Journal*, 2022, [\[Link\]](#).

3. Pavan Reddy M., A. Kumar, and K. Kuchi, "Design and Performance Analysis of Joint Control and Shared Channel Scheduler for Downlink in 3GPP Narrowband-IoT", *Ad Hoc Networks Journal*, vol. 114, 102440, 2021. [\[Link\]](#).

2. Pavan Reddy M., Harish Kumar D., S. Amuru, and K. Kuchi, "Design and Implementation of Beamformed Physical Downlink Control Channel for 4G Massive MIMO Systems", *Ad Hoc Networks Journal*, vol. 111, 102358, 2021. [\[Link\]](#).

1. Pavan Reddy M., G. Santosh, A. Kumar, and K. Kuchi, "Scheduling and Decoding of Downlink Control Channel in 3GPP Narrowband-IoT", in *IEEE Access*, vol. 8, pp. 175612-175624, 2020. [\[Link\]](#).

### Book Chapters

1. Pavan Reddy M., Santosh G., Kumar A., and Kuchi K. "Improved Physical Downlink Control Channel for 3GPP Massive Machine Type Communications", In: *Lecture Notes in Computer Science*, vol 11227. Springer, Cham. [\[Link\]](#).

2. Pavan Reddy M. and Abhinav Kumar, "Resource management and cloud-RAN implementation for narrowband-IoT systems" in *Managing Internet of Things Applications across Edge and Cloud Data Centres. IET Book Chapter*, 2024.

#### Conferences

12. N. Mouni, Pavan Reddy M., Abhinav Kumar, P. Upadhyay, Maurizio M., "Adaptive Multi-User Clustering and Power Allocation for Hybrid OMA-NOMA System with Imperfect SIC", *COMSNETS* 2024.
11. N. Mouni, Pavan Reddy M., Abhinav Kumar, P. Upadhyay, "Enhanced User Pairing and Power Allocation Strategies for Downlink NOMA Systems with Imperfections in SIC", *COMSNETS* 2023. [[Best Poster Award](#)]. [[Link](#)].
10. Priya K., Pavan Reddy M., and Abhinav Kumar "Spectral and Energy Efficient User Pairing for RIS-assisted Uplink NOMA Systems with Imperfect Phase Compensation," *IEEE VTC spring*, 2022. [[Link](#)].
9. N. Mouni, Pavan Reddy M., Abhinav Kumar, and P. Upadhyay, " $\alpha$ -Fairness based User Pairing for Downlink NOMA Systems with Imperfect SIC", *IEEE Globecom*, 2022. [[Link](#)].
8. N. Mouni, Pavan Reddy M., Abhinav Kumar, P. Upadhyay, "DNN based Adaptive User Pairing and Power Allocation to achieve  $\alpha$ -Fairness in NOMA Systems with Imperfections in SIC", *ACM AI-ML Systems* 2022. [[Link](#)].
7. Prashanth L., Pavan Reddy M., Saidhiraj Amuru, and K. Kuchi, "Energy and Delay Efficient Intelligent Release Assistant Indication Scheme for NB-IoT", *COMSNETS*, 2022. [[Link](#)].
6. Pavan Reddy M., A. Kumar, and K. Kuchi, "Joint Link Adaptation and Resource Allocation for Uplink in 3GPP Machine Type Communications," *COMSNETS*, 2022. [[Link](#)].
5. Pavan Reddy M., Mounika R., Abhinav Kumar, and K. Kuchi, "Downlink Resource Allocation for 5G-NR Massive MIMO Systems," *NCC 2022* [[Link](#)].
4. Pavan Reddy M., Harish Kumar D., S. Amuru, and K. Kuchi, "Removing the PDCCH Bottleneck and Enhancing the Capacity of 4G Massive MIMO Systems," *COMSNETS*, Bengaluru, India, 2020, pp. 237-244. [[Best Paper-Honourable Mention](#)]. [[Link](#)].
3. Pavan Reddy M., A. Kumar, and K. Kuchi, "Joint Control and Shared Channel Scheduling for Downlink in 3GPP Narrowband-IoT," *COMSNETS*, Bengaluru, India, 2020, pp. 476-483. [[Link](#)].
2. Pavan Reddy M., G. Santosh, A. Kumar, and K. Kuchi, "Downlink Control Channel Scheduling for 3GPP Narrowband-IoT," *IEEE PIMRC*, Bologna, 2018, pp. 1-7. [[Link](#)].
1. Pavan Reddy M., G. Santosh, A. Kumar, and K. Kuchi, "Novel rate matching scheme for downlink control channel in 3GPP massive machine type communications," *COMSNETS*, Bengaluru, 2018, pp. 183-190. [[Link](#)].

#### REFERENCES

##### Prof. Kiran Kuchi,

Department of Electrical Engineering, IIT Hyderabad,  
 Founder of WiSig Networks Pvt. Ltd.  
[kkuchi@ee.iith.ac.in](mailto:kkuchi@ee.iith.ac.in), [kkuchi@wisig.com](mailto:kkuchi@wisig.com)

##### Dr. Abhinav Kumar,

Associate Professor,  
 Department of Electrical Engineering, IIT Hyderabad,  
[abhinavkumar@ee.iith.ac.in](mailto:abhinavkumar@ee.iith.ac.in)

##### Dr. SaiDhiraj Amuru,

Staff Engineer,  
 Plume Design, Inc.  
[asaidhiraj@gmail.com](mailto:asaidhiraj@gmail.com)