

CONTACT INFORMATION	5-4-78/H/2, APHB Colony, Bhongir, Telangana, India (IN)-508116.	https://pavanreddymanne.github.io pavanreddymanne@gmail.com
EDUCATION	Ph.D. in Electrical Engineering (advisor: Prof. Kiran Kuchi) <i>Indian Institute of Technology Hyderabad</i> Dissertation: "System-Level Modelling and Performance Enhancements for 4G/5G Systems" Received IEEE GraTE7 2022 Best Ph.D. Thesis Award	[Dual Degree] 2014-2021
	M.Tech. in Electrical Engineering <i>Indian Institute of Technology Hyderabad</i>	[Dual Degree] 2014-2021
	B.Tech. in Electronics and Communications Engineering <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 beamforming; protocol design, system building, and evaluation; next-generation multiple access schemes; and reconfigurable intelligent surfaces.	
WORK EXPERIENCE	Principal Architect, WiSig Networks	2023-present
	<ul style="list-style-type: none">Leading the layer-2 R&D team that is building standard compliant 5G base station "Bharath-RAN".<ul style="list-style-type: none">As a lead architect, I have designed a range of cutting-edge algorithms focused on scheduling, link & 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.	
	Lead Engineer, WiSig Networks	2020-2023
	<ul style="list-style-type: none">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">A part of our work was submitted to ITU as a potential technology for IMT 2030 or 6G standard. [Link]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.	
	Research Engineer, WiSig Networks	2018-2020
	<ul style="list-style-type: none">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">With minimal software changes, our idea introduces 5G like beamforming feature to legacy 4G systems.Received Best Paper Award Honorable Mention at COMSNETS 2020 for the work.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.	
ACADEMIC EXPERIENCE	Thesis Co-Advisor for Ph.D. Students	
	<ul style="list-style-type: none">Spandan Bisoyi, <i>IIT Hyderabad</i>, Ongoing	
	Thesis Co-Advisor for M. Tech Students	
	<ul style="list-style-type: none">Kusuma Priya Pulavarty, <i>IIT Hyderabad</i>, 2022Swaraj Srivatsava, <i>IIT Hyderabad</i>, OngoingShivalika Tripathi, <i>IIT Hyderabad</i>, Ongoing	

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 Globecomm, IEEE WCNC.

PATENT APPLICATIONS

Granted Patents

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

6. Structural Massive MIMO and Methods 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 PUBLICATIONS

Journals

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.*, [Accepted-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](#)].

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, " α -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 α -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

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