

Prasad Anjangi, Ph.D.

315 Jln Ahmad Ibrahim, Sperry Technology, Halliburton, Singapore, SG 639940

Phone: (65) 82980480 — Website: prasadanjangi.github.io

Email: prasad.anjangi@u.nus.edu — prasadtiru@gmail.com

EDUCATION

National University of Singapore (NUS), Singapore

Aug 2012 - Jan 2017

Ph.D., Electrical & Computer Engineering

- **Dissertation topic:** “Transmission Scheduling Strategies for Underwater Acoustic Networks with Large Propagation Delays”
- **AI/ML context:** Formulated network scheduling as dynamic programming problems, laying the groundwork for subsequent applications of reinforcement learning in highly constrained, high-latency environments.
- **Advisor:** Prof. Mandar Chitre — **Oral defence date:** 02 December 2016

Indian Institute of Technology (IIT), Bombay, Mumbai, India

Jun 2007 - May 2009

M.Tech., Biomedical Engineering

- **Dissertation topic:** “MEMS Sensors for Gases and Vapors” (Advisor: Prof. Soumyo Mukherjee)

Andhra University, Visakhapatnam, India

Jun 2003 - May 2007

B.E., Electronics & Instrumentation Engineering

- **Final-year project:** “Hardware-in-the-loop simulation of a series hybrid vehicle”

PROFESSIONAL EXPERIENCE

Halliburton, Singapore

Jan 2023 - Present

Principal R&D Engineer

- **AI-augmented downhole telemetry:** Architected end-to-end AI pipelines that fuse real-time surface measurements with advanced time-series modelling to predict signal attenuation over depth. Deployed real-time decoders that improve transmission reliability and data rates in high-noise drilling environments.
- **Digital twins & simulation:** Architected a high-fidelity physics-based channel simulator for downhole telemetry systems. Modelled complex wave propagation through drill strings—incorporating dynamic source/receiver placements, pump noise, and signal attenuation—to extract channel impulse responses and synthesize realistic received signals for algorithm validation.
- **Agile project leadership:** Serve as Certified ScrumMaster for the R&D team, driving sprint planning, technical coordination, and delivery of cross-functional engineering projects.
- **IP generation & applied R&D:** Translated signal processing research into corporate intellectual property. Secured Trade Secret classification for telemetry optimization algorithms and authored a Bottom Hole Assembly (BHA) optimizer technical disclosure, currently under review by the corporate patent committee.

Subnero Pte. Ltd., Singapore

Nov 2016 - Jan 2023

Senior Research Scientist

- **Applied AI for subsea infrastructure and urban systems:** Drove research toward practical business objectives in high-performance underwater acoustic and wireless communications, providing networking infrastructure for subsea monitoring and smart marine systems.
- **Physics-informed and data-driven AI:** Developed a machine learning-based adaptive modulation technique for underwater acoustic links. Implemented a model-based, data-driven learning algorithm that integrates domain physics with learning frameworks to enhance communication performance in highly constrained environments.

- **Edge AI & hardware implementation:** Collaborated with firmware engineers to optimize complex signal processing and ML algorithms for deployment on underwater modems and sensors.
- **Underwater cellular networks & USBL:** Led projects on underwater cellular-like acoustic networks for autonomous underwater vehicles (AUVs) and Ultra Short Baseline (USBL) systems for direction-of-arrival estimation and localisation.
- **Sensor fusion for diver localisation:** Designed and implemented communication protocols, localisation protocols, and sensor fusion algorithms for diver communication systems.

National University of Singapore, Singapore

Jan 2013 - Jan 2016

Graduate and Teaching Assistant, Department of Electrical & Computer Engineering

- Served as a graduate assistant in the signals and systems laboratory for six semesters, providing technical guidance and applied learning support to undergraduate students.

STMicroelectronics, Greater Noida, UP, India

Dec 2011 - Aug 2012

Senior Design Engineer

- Developed firmware and applications for Zigbee-based Smart Street Lighting and Palm-based Smart Energy Management Devices.

Atmel (now Microchip), Chennai, TN, India

Jun 2009 - Dec 2011

Firmware Engineer

- Brought up the Platform Abstraction Layer (PAL) of a wireless stack for the first AVR32-based microcontroller platform.

RESEARCH INTERESTS & EXPERTISE

- **Applied AI & Machine Learning:** Time-series modelling, reinforcement learning, physics-informed/model-based data-driven AI, Bayesian networks, and sequential decision problems.
- **AI-Augmented Engineering & Urban Systems:** Downhole telemetry optimization, sub-sea infrastructure monitoring, and sensor fusion.
- **Wireless Communications & Networking:** AI-inspired adaptive modulation, cooperative communication, distributed computing, physical layer signal processing.
- **Navigation & Localisation:** Sensor fusion algorithms (Kalman filters, Bayesian networks) and ultra-short baseline localisation.

GRADUATE STUDENT SUPERVISION & INDUSTRY MENTORSHIP

- **Industry co-supervisor:** Ms. Wu Shuangshuang, Ph.D. student, Department of ECE, NUS (co-supervised with Prof. Mandar Chitre). Mentored research on adaptive modulation and reinforcement learning strategies.
- **Industry mentor:** Mentor a junior R&D engineer at Halliburton on embedded and real-time systems, bridging academic coursework with commercial telemetry applications.

APPLIED LEARNING INSTRUCTION & INDUSTRY WORKSHOPS

- **Pedagogical approach:** Designed and delivered project-based, experiential learning curricula for software-defined modems and acoustic networks to global engineering cohorts.
- Prasad Anjangi, Shiraz Shahabudeen, Chinmay Pendharkar 2020. “Practical Underwater Software Defined Networking,” IEEE OCEANS’20, Singapore, Aug 2020. (*Instructor*)
- Prasad Anjangi 2019. “Simulation of Underwater Communications (SUC’19)”, NIT Surathkal, India, Dec 2019. (*Instructor*)
- Mandar Chitre, Chinmay Pendharkar, Prasad Anjangi, Manu Ignatius, 2018. “Hands-on with software defined modems & underwater networks”, Biograd Na Moru, Croatia, Oct 2018. (*Contributor*)
- Prasad Anjangi, Mandar Chitre, Shiraz Shahabudeen, 2018. “A Tutorial on Underwater Acoustic Networking,” IEEE OCEANS’18, Kobe, Japan, May 2018. (*Instructor*)

PATENTS, NON-PUBLICATION OUTPUTS & GRANTS

- **Granted patents:** P. Anjangi, M. Chitre, M. Ignatius, C. Pendharkar, “Receiver system and a method for receiving a transmitted signal via a long-range link,” 2025. ([US Patent US12284022B2](#)).
- **Technical disclosures & trade secrets:** “Optimizing Bottom Hole Assembly in a Drillstring for Telemetry,” Halliburton. (Classified as Trade Secret).
- **Open-Source Contributions & Code:**
 - Significant contributor to the [unetpy](#) and [fjagepy](#) Python packages for underwater networking and agent frameworks.
 - Core developer for the [unetsocket](#) module in the `unet-contrib` repository.
 - Authored Requests for Comments (RFCs) for the open-source UnetStack framework (e.g., *RFC U0002: Spatial Diversity Framework in UnetStack*, *RFC U0005: Ultra-short Baseline System for Localisation*).
- **Technical Reports:**
 - P. Anjangi, “Distributed Cooperative Diversity System Development for Underwater Acoustic Networks”, 2019.
 - P. Anjangi, “Design and Implementation of Cooperative Strategies Exploiting Spatial Diversity in Underwater Acoustic Networks”, 2018.
 - P. Anjangi, “Cooperative Strategies for Exploiting Spatial Diversity in Underwater Acoustic Networks”, 2017.
- **Technical Blogs:**
 - P. Anjangi, “Synchronizing physical clocks among different UnetStack-based modems”, 2021.
 - P. Anjangi, “What’s so ‘super’ about Super-TDMA?”, 2020.
 - P. Anjangi, “Exploiting Distributed Spatial Diversity Using UnetStack”, 2020.
 - P. Anjangi, “Using MATLAB with UnetStack”, 2019.
 - P. Anjangi, “Basic modem operations using UnetStack”, 2018.
 - P. Anjangi, “On underwater localisation using UnetStack”, 2018.
- **Grants:** Co-PI on “Extending Communication Range and Improving Data Rates by Harnessing Spatial Diversity in a Distributed Underwater Network” (SGD 477,000, MINDEF, 2016-2019). Significant contributor to “Development of Total Integrated Dive System” (SGD 60,000, DSTA, 2019-2020).

PEER-REVIEWED PUBLICATIONS

- W. Shuangshuang, M. Chitre and **P. Anjangi**, “Adaptive Modulation and Coding With Feedback Scheduling for an Underwater Acoustic Link,” in *IEEE Journal of Oceanic Engineering*, doi: 10.1109/JOE.2025.3585657.
- **P. Anjangi**, Navarro, Rex Dael, Sobhana, Rashobh Rajan, Chagas, Felipe Costa Oliveira, and Bipin Pillai. “AI-Aided Real-Time Data Decoder for Mud Pulse Telemetry—A Case Study.” *SPE Conference at Oman Petroleum & Energy Show*, Muscat, Oman, May 2025. doi: <https://doi.org/10.2118/224992-MS>
- M. Ignatius, **P. Anjangi**, M. Chitre, 2023. “Smart Wireless Data Transfer Solution for Underwater Sensors Powered by Edge Computing”. in *Offshore Technology Conference*, 2023.
- Wu Shuangshuang, **P. Anjangi**, M. Chitre, 2022, September. “Adaptive Modulation and Feedback Strategy for an Underwater Acoustic Link”. in *IEEE UComms’22*, (Lerici, Italy) September 2022.
- Wu Shuangshuang, M. Chitre, **P. Anjangi** 2021, September. “Monte Carlo Tree Search and Feedback Adaptation for Underwater Acoustic Link Tuning”. in *IEEE Oceans’21*, (San Diego U.S.) September 2021.
- M. Ignatius, **P. Anjangi**, 2021. “Multichannel Modems: The ‘Swiss Army Knife’ of Acoustic Modems in the Maritime Domain”. *Sea Technology*, 2021.
- **P. Anjangi**, M. Chitre, M. Ignatius, C. Pendharkar 2020, September. “Distributed Spatial Di-

- versity Enabled Receiver System for an Underwater Acoustic Link”. In *2021 Fifth Underwater Communications and Networking Conference (UComms)*. IEEE.
- **P. Anjangi**, M. Chitre, 2020, August. “Diver Communications and Localisation System Using Underwater Acoustics”. in *IEEE Global Oceans’20*, (Singapore, Gulf Coast U.S.), October 2020.
 - **P. Anjangi**, Chitre, M. (2018, August). “Model-based Data-driven Learning Algorithm for Tuning an Underwater Acoustic Link”. In *2018 Fourth Underwater Communications and Networking Conference (UComms)* (pp. 1-5). IEEE. (Lerici, Italy). (*Demonstrates physics-guided model-based learning*)
 - **P. Anjangi** and M. Chitre, “Propagation Delay Aware Unslotted Schedules with Variable Packet Duration for Underwater Acoustic Networks,” *IEEE Journal of Oceanic Engineering*, pp. 1-17, January 2017. (*Derives from PhD thesis dynamic programming formulations*)
 - **Invited Paper: P. Anjangi**, Chitre M. “Experimental demonstration of super-TDMA: A MAC protocol exploiting large propagation delays in underwater acoustic networks”. In *2016 IEEE Third Underwater Communications and Networking Conference (UComms) 2016 Aug 30* (pp. 1-5). (Lerici, Italy)
 - **Invited Paper: P. Anjangi**, Chitre M. “Unslotted transmission schedules for practical underwater acoustic multihop grid networks with large propagation delays ”. In *2016 IEEE Third Underwater Communications and Networking Conference (UComms) 2016 Aug* (pp. 1-5). (Lerici, Italy)
 - **Best Experimental Student Paper Award: P. Anjangi**, Chitre M. “Design and Implementation of Super-TDMA: A MAC Protocol Exploiting Large Propagation Delays for Underwater Acoustic Networks”. In *Proceedings of the 10th International Conference on Underwater Networks & Systems 2015 Oct 22* (p. 1). ACM. (Washington DC, USA)
 - **P. Anjangi** and M. Chitre, “Scheduling Algorithm with Transmission Power Control for Random Underwater Acoustic Networks,” in *IEEE OCEANS’15*, (Genoa, Italy), May 2015.

FIELD TRIAL EXPERIENCE

- **Far Eastern Federal University, Vladivostok, Russia:** A Collaborative Sea Experiment Measuring Ranges using Underwater Acoustic Modems, 2016.
- **Qingdao, China:** Performance tests of Subnero underwater acoustic modems in collaboration with Harbin Engineering University, China, 2017.
- **Biograd Na Moru, Croatia:** Demonstration of underwater localisation of a mobile node using two underwater acoustic modems and a transponder, 2018.
- **Selat Puah & St. Johns Island, Singapore:** Numerous field experiments ranging from performance measurements of implemented algorithms to demonstrations, 2012–2019.

AWARDS & SCHOLARSHIPS

- **Recognized Outstanding Reviewer** for 2016 and 2021 by the Editorial Board of the IEEE Journal of Oceanic Engineering.
- **Best Experimental Student Paper Award** at ACM WUWNet 2015, Washington DC.
- **Atmel Spot Excellence Award** for early delivery of a MAC-layer port to a 32-bit micro-controller platform.
- **NUS Research Scholarship**, National University of Singapore (NUS), Singapore, 2012-16.
- **Graduate Scholarship**, Graduate Aptitude Test in Engineering (GATE), Ministry of Human Resource Development, Govt. of India, 2007-2009.
- **First Prize** for a stair-climber robot built from electronic waste at SCULPT, a national-level event.
- **First Prize** for a paper on temperature control using fuzzy logic at SPIKES 05, a national-level student symposium at Andhra University.
- **Second Prize** for a paper on condition monitoring for machine health at TECNOZION 07, a national-level event at NIT Warangal.

PROFESSIONAL VOLUNTARY SERVICES

- **Reviewer for international journals:** IEEE Journal of Oceanic Engineering, IEEE Transactions on Communications, IEEE Transactions on Wireless Communications, IEEE Communication Letters, IEEE Wireless Communications Letters, Elsevier Ad Hoc Networks, Wiley Journal of Wireless Communications and Mobile Computing, Journal of Sensor and Actuator Networks, IEEE Transactions on Mobile Computing.
- **Reviewer for international conferences:** IEEE UComms, ACM WUWNet, IEEE Oceans.
- **Technical Program Committee Member:** ACM WUWNet 2016, A Workshop on Underwater Networks.
- **Voluntary activities:** Helped organize the Singapore AUV Challenge (SAUVC), an event promoting underwater robotics in Asia, in 2017, 2018, and 2019.

SKILLS

- **Programming:** Python, Julia, Groovy, Java, MATLAB, C, Mathematica, L^AT_EX
- **Software/Frameworks:** TensorFlow, PyTorch, UnetStack, Theano, MOSEK, CVX
- **Algorithms:** Time-series modelling, reinforcement learning, dynamic programming, extended Kalman filtering, mixed-integer linear programming, direction-of-arrival estimation.
- **Web development:** JavaScript, HTML, CSS
- **Certifications:** Certified ScrumMaster (CSM)