

Chance Tarver

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EXPERIENCE

Samsung Research America

Staff Research Engineer

March 2023 – Present

Project 1. Upper Mid-band MIMO PoC:

- Leading development of RF PoC for upper mid-band hybrid massive MIMO platform.

Senior Systems Design/Architecture Engineer

Jan 2020 – March 2023

Project 1. Sub-band Full Duplex:

- Developed digital self-interference suppression algorithm to reduce self-interference in massive MIMO.
- Developed massive MIMO digital predistortion system to further reduce self-interference and meet emission requirements in 5G systems.
- Implemented the above in a modular software platform to allow for agile development and rapid prototyping and integrated into real-time, FPGA, RF platform for field evaluation of performance.

Project 2. Satellite Communications System:

- Developed modifications to RACH/HARQ procedures and implemented changes in srsLTE C++ to support long latency satellite links.
- Created a chat client demo suite for the project using React JS consisting of push-to-talk, instant messaging, and image transfer.
- Completed a real-time demo of the above using USRPs and satellite channel emulator.

Project 3. Distributed MIMO:

- Developed software systems to interface with custom FPGA SDR platform.
- Led field testing of the platform to study distributed MIMO channels and reciprocity calibration concerns.

Samsung Research America

May 2017 – Dec 2017, May 2019 – Aug 2019

RF and PoC Intern

- Developed GPU acceleration for baseband signal processing algorithms to be deployed in a V-RAN system
- Developed real-time, spectrum-sharing tools for LTE using LABView Communications including a custom FPGA design for the USRP

Lockheed Martin

May 2016 – Aug 2016

College Student Tech SR. Specialist, Intern

- SDR development with the Cyber Solutions IRAD group in Hanover, MD
- Used GNURadio to develop a real-time, wireless sensing application

EDUCATION

Rice University, Houston, Texas, USA

Ph.D. in Electrical and Computer Engineering

May 2016 – Aug 2022

Advisor: Professor Joseph R. Cavallaro

Thesis Title: *Nonlinearity Correction in Massive MIMO Systems via Virtual DPD*

- Created a neural network architecture to perform predistortion before precoding in massive MIMO, allowing for reduced complexity.

M.S. in Electrical and Computer Engineering

Aug 2014 – May 2016

Thesis Title: *Sub-band Digital Predistortion for Noncontiguous Carriers: Implementation and Testing*

- Created predistortion algorithms for reduced complexity and sample rate DPD for carrier aggregation in LTE.

Louisiana Tech University, Ruston, Louisiana, USA

Bachelor of Science in Electrical Engineering (B.S.E.E)

Aug 2010 – May 2014

Senior Design Project: 250 W HF Power Amplifier

- Design, fabrication, and analysis of a type AB broadband power amplifier with 12 dB gain

Bachelor of Science (B.S.) in Mathematics

Aug 2010 – May 2014

- Advanced study of topics in linear algebra and analysis

PUBLICATIONS Please see my Google Scholar page for the latest publications and citation statistics.

C. Tarver, A. Balasoukas-Slimining, C. Studer and J. R. Cavallaro, "Virtual DPD Neural Network Predistortion for OFDM-based MU-Massive MIMO," 2021 55th Asilomar Conference on Signals, Systems, and Computers.

H. Ji, Y. Kim, T. Kim, K. Muhammad, C. Tarver, M. Tonnemacher, J. Oh, G. Xu "Enabling Advanced Duplex in 6G," 2021 IEEE International Conference on Communications Workshops.

C. Tarver, A. Balasoukas-Stimming, C. Studer and J. R. Cavallaro, "OFDM-Based Beam-Oriented Digital Predistortion for Massive MIMO," 2021 IEEE International Symposium on Circuits and Systems.

C. Tarver, M. Tonnemacher, H. Chen, J. Zhang and J. R. Cavallaro, "GPU-Based, LDPC Decoding for 5G and Beyond," in IEEE Open Journal of Circuits and Systems, vol. 2, pp. 278-290, 2021.

C. Tarver, A. Balasoukas-Stimming and J. R. Cavallaro, "Predistortion of OFDM Waveforms using Guard-band Subcarriers," 2020 54th Asilomar Conference on Signals, Systems, and Computers.

M. Tonnemacher, C. Tarver, V. Chandrasekhar, H. Chen, Pe. Huang, B. Loong Ng, J. Zhang, J. R. Cavallaro, and J. Camp, "Opportunistic Channel Access Using Reinforcement Learning in Tiered CBRS Networks", 2018 DySPAN.

C. Tarver and J. R. Cavallaro, "Digital predistortion with low-precision ADCs," 2017 51st Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, 2017, pp. 462-465.

C. Tarver, M. Abdelaziz, L. Anttila, M. Valkama, J.R. Cavallaro,, "Low-complexity, Multi Sub-band Digital Predistortion," in *Journal of Signal Processing Systems*, Nov 2017.

C. Tarver, M. Abdelaziz, L. Anttila, and J. R. Cavallaro, "Multi Component Carrier, Sub-band DPD and GNURadio Implementation," IEEE International Symposium on Circuits and Systems, Baltimore, MD, May 2017.

Li, K., Ghazi, A., Tarver, C. et al., "Parallel Digital Predistortion Design on Mobile GPU and Embedded Multicore CPU for Mobile Transmitters", *Journal of Signal Processing Systems* (2017) 89: 417.

M. Abdelaziz, L. Anttila, C. Tarver, K. Li, J. R. Cavallaro and M. Valkama, "Low-Complexity Subband Digital Predistortion for Spurious Emission Suppression in Noncontiguous Spectrum Access," in IEEE Transactions on Microwave Theory and Techniques, vol. 64, no. 11, pp. 3501-3517, Nov. 2016.

C. Tarver, M. Abdelaziz, L. Anttila, M. Valkama and J. R. Cavallaro, "Low-Complexity, Sub-band DPD with Sequential Learning: Novel Algorithms and WARPLab Implementation," 2016 IEEE International Workshop on Signal Processing Systems (SiPS), Dallas, TX, 2016, pp. 303-308.

M. Abdelaziz, C. Tarver, K. Li, L. Anttila, M. Valkama, and J. R. Cavallaro, "Sub-band Digital Predistortion for Noncontiguous Transmissions: Algorithm Development and Real-time Prototype Implementation," 2015 49th Asilomar Conference on Signals, Systems and Computers, Pacific Grove, CA, 2015.

- TEACHING EXPERIENCE** Fundamentals of Computer Engineering, Teaching Assistant Jan 2015 – May 2019
ELEC 220, Rice University
- Developed the current lab curriculum which focused on using C and its disassembly to demystify the inner workings of an ARM CPU.
 - Taught the lab sections, directly interacting with the students and ensuring the material was comprehended.
- VOLUNTEERING** IEEE, EDS-ETC 2015 – 2019
- Participated and designed lessons for local K12 schools using the “snap circuits” platform to help educate youth about basic circuits concepts.

[CV compiled on 2023-03-16]