# Shailesh Chaudhari

schaudhari@ucla.edu

## Research Interests

- Applications of machine learning for wireless communication systems-PHY layer,
- Multiuser MIMO, massive MIMO systems, interference mitigation using beamforming,
- Resource allocation in wireless systems,
- Spectrum sensing, cognitive radio, dynamic spectrum access.

## Education

- **Ph.D., Electrical and Computer Engineering** Sep.'13-Jun.'18
  University of California, Los Angeles, USA
  Dissertation: Interference Management in MIMO Cognitive Radio Networks.
  Adviser: Prof. Danijela Cabric
- **M.S., Electrical Engineering** Sep.'11-Jun.'13
  University of California, Los Angeles, USA
  Project: On Performance Comparison between MIMO and SISO in Indoor Environment.
- **B.Tech., Electronics and Telecommunications** Jul.'06 - Jun.'10
  University of Pune, India
  Project title: Image Fusion Technique for Palm Print Recognition.

## Work Experience

- **Staff Engineer, Samsung Semiconductor, Inc., San Diego, USA** Jul.'18-Present
  - Machine learning for various applications in 5G NR wireless modem: MIMO detection, interference whitening, CSI feedback, resource allocation.
  - Received President's award for achieving significant complexity reduction in MIMO detector.

- **Graduate Student Researcher, University of California, Los Angeles** Sep.'13-Jun.'16,Oct.'16-Jun'18
  *Research projects*:
  - Dynamic power and channel allocation for underlay MIMO cognitive radio.
  - User selection and power allocation in massive MIMO cognitive radio networks.
  - Localization of cyclostationary sources in the presence of interference.
  - DARPA CLASIC: Blind modulation classification under unknown multipath fading channels.

- **Intern-WLAN Systems, Qualcomm Technologies Inc., San Jose, USA** Jun.'16-Sep.'16
  - Digital pre-distortion for power amplifiers to reduce transmit EVM.

- **Software Engineering Intern (Independent Contractor), Silvus Technologies, Los Angeles, USA** Jan.'13-May'13
  - Development of user interface for MIMO radio using JavaScript and Python.
  - Development of temperature control mechanism for MIMO radio.

- **Software Engineer, Cisco Systems, Pune, India** Jul.'10- Aug.'11
  - Software testing for session recovery for PDN and Serving Gateways in LTE network.

## Publications

### Patents

- **S. Chaudhari,** H. Kwon, K. Song, "Machine learning based interference whitener selection", Application No. US17/339752.
- H. Kwon, **S. Chaudhari**, K. Song, "Multiple-input multiple-output (MIMO) detector selection using neural network", Publication no. US 2020/0293894 A1.
- H. Kwon, **S. Chaudhari**, K. Song, "Multiple-input multiple-output (MIMO) detector selection using neural network", continuation in part, Publication no. US 2020/0293896 A1.

### Journal Publications

- **S. Chaudhari**, D. Cabric, "Power Control and Frequency Band Selection Policies for Underlay MIMO Cognitive Radio", in *IEEE Trans. on Cognitive Comm. and Networks, 2019.*
- **S. Chaudhari**, D. Cabric, "QoS Aware Power Allocation and Secondary User Selection in Massive MIMO Cognitive Radio Networks", *in IEEE Trans. on Cognitive Comm. and Networks, 2017.*
- **S. Chaudhari**, D. Cabric, "Cyclic Weighted Centroid Algorithm for Primary User Localization in the Presence of Interference", *in IEEE Trans. on Cognitive Comm. and Networks, 2016.*

### Conference Proceedings

- **S. Chaudhari,** H. Kwon, K. Song, D. Bai, H. Shin, "Deep learning based resource allocation for CA and MIMO ports in RF front-end", submitted to *IEEE Globecom 2022*.
- **S. Chaudhari,** H. Kwon, "Machine learning based interference whitening in 5G NR MIMO receiver", *in VTC Spring 2022*.
- **S. Chaudhari**, H. Kwon, K. Song "MIMO Detector Selection for Multiple High-Order Modulations with Unified Neural Network", *in IEEE Globecom, 2020.*
- **S. Chaudhari**, H. Kwon, K. Song "Reliable and Low-Complexity MIMO Detector Selection using Neural Network", *in IEEE ICNC, 2020.*
- **S. Chaudhari**, D. Cabric, "Unsupervised Frequency Clustering Algorithm for Null Space Estimation in Wideband Spectrum Sharing Networks", *in IEEE GlobalSIP, 2017.*
- **S. Chaudhari**, D. Cabric, "Kuiper Test based Modulation Level Classification under Unknown Frequency Selective Channels", *in IEEE GlobalSIP, 2017.*
- H.Yan, **S. Chaudhari**, D. Cabric, "Wideband Channel Tracking for mmWave MIMO System with Hybrid Beamforming Architecture", *(invited paper) in IEEE CAMSAP, 2017.*
- X Wang, **S. Chaudhari**, M. Laghate, and D. Cabric, "Wideband Spectrum Sensing Measurement Results using Tunable Front-End and FPGA Implementation", *in Asilomar conf. on Signals, Systems, and Computers, 2017.*
- M. Laghate, **S. Chaudhari**, and D. Cabric, "USRP N210 Demonstration of Wideband Sensing and Blind Hierarchical Modulation Classification", *in IEEE DySPAN Workshop: Battle of the ModRecs, 2017.*
- **S. Chaudhari**, D. Cabric, "Feasibility of Serving K Secondary Users in Underlay Cognitive Radio networks using Massive MIMO", *in ITG conf. on Systems, Comm., Coding (SCC), 2017.*
- **S. Chaudhari**, D. Cabric, "Downlink Transceiver Beamforming and Admission Control for Massive MIMO Cognitive Radio Networks", *in Asilomar conf. on Signals, Systems and Computers, 2015.*
- **S. Chaudhari**, D. Cabric, "Cyclic Weighted Centroid Localization for Spectrally Overlapped Sources in Cognitive Radio Networks", *IEEE Globecom, 2014.*

## Reviewing Experience

- Reviewed over 90 journal and conference manuscripts.
- Journals:
    - IEEE Access
    - IEEE Transactions on Cognitive Communication and Networks
    - IEEE Transactions on Mobile Computing
    - IEEE Communications Letters
    - IEEE Wireless Communications Letters
    - IEEE Transactions on Communications
    - IEEE Transactions on Wireless Communications
    - IEEE Transactions on Circuits and Systems I
    - IEEE Transactions on Vehicular Technology
    - EURASIP Journal on Wireless Communications and Networking
- Conferences:
    - IEEE ICC, IEEE Globecom, IEEE GlobalSIP, IEEE DySpan, IEEE PIMRC, IEEE VTC
    - Served as a TPC member in VTC'19,'20, ICC'21, '22, Globecom'22

## Teaching Experience

- Teaching Fellow, University of California, Los Angeles
  *Courses taught:*
  - EE102: Systems and Signals (Jan.'18-Mar.'18)
- Teaching Associate, University of California, Los Angeles
  *Courses taught:*
  - EE102: Systems and Signals (Jan.'16-Mar.'16, Jan.'17-Mar.'17)
- Teaching Assistant, University of California, Los Angeles
  *Courses taught:*
  - PIC 10A: Introduction to Programming (Sep.'12-Dec.'12)
  - Physics 4BL: Electricity and Magnetism (Apr.'12-Jun.'12)
- Special Reader, University of California, Los Angeles
  - EE230A-80: Detection and Estimation in Communication Systems and Radars (Sep.'17-Dec.'17)
  - EE209AS: Special Topics in Wireless System Design
    (Apr.'13-Jun.'13, Apr.'15-Jun.'15, Apr.'17-Jun.'17)
  - EE233-80: Wireless Communications System Design, Modelling, and Implementation
    (Apr.'18-Jun.'18)

# Awards and Achievements

- UCLA graduate division fellowship '13-'14
- Gold medal for overall first rank in B. Tech. at College of Engineering, Pune (India) '06-'10
- National talent search scholarship of India '04-'10