

# Yun Chen

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## EDUCATION

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- **North Carolina State University (NCSU)** Raleigh, NC  
*PhD, Electrical and Computer Engineering* Jan. 2021 - present  
- **Core Courses:** Detection and Estimation Theory
- **The University of Texas at Austin (UT Austin)** Austin, TX  
*M.S., Electrical and Computer Engineering (GPA: 3.95/4.0)* Aug. 2018 - Dec. 2020  
- **Core Courses:** Large Scale Optimization, Wireless Communications Lab, Digital Image Processing, Game Theory, Block-chain Technologies, Graph Theory, Reinforcement Learning, Data Mining, Digital Video, Statistic Methods, Machine Learning.
- **Southeast University** Nanjing, China  
*Bachelor of Engineering in Information Engineering (GPA: 89.13/100)* Aug. 2013 - Jun. 2017

## PUBLICATIONS

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- 1 **Y. Chen**, X. Lin, T. Khan, M. Afshang, M. Mozaffari, "5G Air-to-Ground Network Design and Optimization: A Deep Learning Approach", in *The 2021 IEEE 93rd Vehicular Technology Conference (IEEE VTC 2021)*, Helsinki, Finland, Apr., 2021, accepted.
- 2 **Y. Chen**, X. Lin, T. Khan, M. Mozaffari, "A Deep Learning Approach to Efficient Drone Mobility Support", in *The 2nd Workshop on Drone Assisted Wireless Communications for 5G and Beyond - co-located with ACM MobiCom 2020 (DroneCom 2020)*, London, United Kingdom, Sep. 2020.
- 3 **Y. Chen**, N. Gonzalez-Prelcic, RW. Heath, "Collision-free UAV Navigation with a Monocular Camera Using Deep Reinforcement Learning", in *2020 IEEE International Workshop on Machine Learning for Signal Processing*, Espoo, Finland, Sep. 2020.
- 4 [**Best Paper**] **Y. Chen**, X. Lin, T. Khan, M. Mozaffari, "Efficient Drone Mobility Support Using Reinforcement Learning", in *2020 IEEE Wireless Communications and Networking Conference (IEEE WCNC 2020)*, Seoul, South Korea, May. 2020.
- 5 **Y. Chen**, W. Yan, C. Li, Y. Huang, and L. Yang, "Personalized Optimal Bicycle Trip Planning Based on Q-learning Algorithm", in *2018 IEEE Wireless Communications and Networking Conference (IEEE WCNC 2018)*, Barcelona, Spain, Apr. 2018.
- 6 Y. Wang, **Y. Chen**, H. Dai, Y. Huang, and L. Yang, "A Learning-Based Approach for Proactive Caching in Wireless Communication Networks", in *The Ninth International Conference on Wireless Communications and Signal Processing*, Nanjing, China, Oct. 2017.

## RESEARCH AND INDUSTRY PROJECTS

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- **Passive Radar Aided Communication Covariance Estimation Using Deep Learning** Sep. 2020 - present  
*Graduate Research Assistant, UT Austin - Prof. Nuria González Prelcic* Austin, TX  
- Propose an Encoder-Decoder architecture for radar channel covariance to communication channel covariance translation.
- **Deep Learning Based 5G Air-to-Ground Network Design and Optimization [1]** May. 2020 - Aug. 2020  
*Research Intern, Ericsson Inc. - Prof. Ali Khayrallah* Santa Clara, CA  
- Proposed a double-DNN architecture for 5G A2G network behavior approximation as well as network deployment optimization.  
- Optimized A2G network parameters such as ISD, antenna tilts, etc. for high user throughput.  
- Achieved similar or better performance w.r.t user throughput and SINR comparing with the deployments in the dataset.
- **Video Assisted UAV Ego-movement Tracking** Feb. 2020 - May. 2020  
*Project of Course "Digital Video" - Prof. Alan Bovik* Austin, TX  
- Analysed pixel transformations in image sequences for visual odometry.  
- Trained a DNN to predict pixel location and depth of sequential images using unsupervised learning.  
- Predicted 6-DOF ego-motion for a UAV based on the video inputs from the on-board monocular camera.
- **Collision-free UAV Navigation with a Monocular Camera Using Deep Reinforcement Learning[3]** Sep. 2019 - Feb. 2020  
*Graduate Research Assistant, UT Austin - Prof. Nuria González Prelcic, Prof. Robert Heath* Austin, TX  
- Proposed a UAV navigation system with a monocular camera using deep reinforcement learning (DRL).  
- Reduced 25% of the flight distance and avoided 50% of the unnecessary turns for the UAV.  
- Alleviated wrong predictions from the deep networks by combining object detection.
- **Efficient Drone Mobility Support Based on (Deep) Reinforcement Learning [2][4]** May. 2019 - Aug. 2019  
*Research Intern, Ericsson Inc. - Prof. Ali Khayrallah* Santa Clara, CA  
- Proposed a Q-learning based handover (HO) scheme for UAVs, striking a balance between the connectivity quality and HO cost.  
- Extended the work to DQN based HO scheme, which allows for larger state and action space.  
- Realized 80% reduction in the number of HOs while guaranteed reliable connectivity.
- **Monocular Camera Based Fitness Motion Correction** Nov. 2018 - Dec. 2018  
*Team Leader, Project of Course "Digital Image Processing", Advisor - Prof. Alan Bovik* Austin, TX  
- Realized bone and joint recognition based on OpenPose framework.  
- Performed 2D to 3D image transformation to get joint angles of human bodies.  
- Realized correction of fitness motions (plank, squats, etc.) by analysing skeleton positions and joint angles.

- **Basic IEEE 802.11ad System Implementation** Nov. 2018 - Dec. 2018  
*Course Project of "Wireless Communications Lab" - Prof. Robert Heath* Austin, Texas
  - Completed frame synchronization, carrier frequency offset estimation, channel estimation based on correlation of Golay sequences.
  - Performed frequency domain equalization.
  - Reached symbol error rate (SER) of  $10^{-5}$  with SNR of 10 dB.
- **Personalized Bicycle Trip Planning Based on Q-learning Algorithm [5]** Mar. 2017 - Jun. 2017  
*Undergraduate Research Assistant, Excellent (Top 10) Graduation Project in SEU - Prof. Luxi Yang* Nanjing, China
  - Generated overall optimal bicycle trips with the Q-learning algorithm.
  - Proposed a novel algorithm for route augmentation while maintaining overall optimality.
- **A Learning-Based Approach for Proactive Caching in Wireless Networks [6]** Mar. 2017 - Jun. 2017  
*Undergraduate Research Assistant - Prof. Luxi Yang* Nanjing, China
  - Estimated content popularity for caching using a novel regularized singular value decomposition and transfer learning.
  - Maximized caching efficiency of small-cell base stations by designing an iterative algorithm.
- **Mobile Task Assignment in Wireless Networks with Crowdsensing** Jan. 2017 - Apr. 2017  
*Undergraduate Research Assistant - Prof. Chunguo Li and Prof. Luxi Yang* Nanjing, China
  - Predicted user trajectories and content distributions using Echo State Network (ESN).
  - Assigned online tasks to mobile users by perfect matching with the Hungarian algorithm.

## PATENTS

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- **Y. Chen, X. Lin, T. Khan, M. Mozaffari**, "Efficient 3D Mobility Support Using Reinforcement Learning", processing.
- **Y. Chen, X. Lin, T. Khan, M. Afshang, M. Mozaffari**, "Network Design and Optimization Using Deep Learning", processing.

## TEACHING EXPERIENCE

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- **Teaching Assistant** Spring 2019  
*Probability and Random Process, UT Austin - Prof. Pedro Santacruz* Austin, TX

## HONORS AND AWARDS

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- Best Paper Award in 2020 IEEE WCNC (Top 4 out of 400 accepted papers) May 2020
- Excellent Graduation Project in SEU (Top 10 out of 260 projects) Jun. 2017
- Honorable Mention in the Mathematical Contest in Modeling (MCM) Apr. 2016
- Leike Scholarship (Top 5% out of 1600 students) Jun. 2015
- 2<sup>nd</sup> Prize out of 1000 students in Provincial Advanced Mathematics Competition Jun. 2014

## PROFESSIONAL SKILLS

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- **Computer Skills:**
  - Language: Python, Matlab, C++, HTML
  - Framework: Pytorch, Tensorflow
  - Platform: ROS
- **Language:** English (fluent), Mandarin (native)