I-No Liao

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INTERESTS

Machine Learning, Data Mining, and Computer Vision

EDUCATION

National Chiao Tung University　　　　　　　　　　　　　　　　　　　Hsinchu, Taiwan
Master of Science in Electronics Engineering; GPA: 94.22/100 (4.25/4.3)　　　*Sept. 2012 – Sept. 2014*
- **Thesis:** A Millimeter-Wave RFID Passive Tag IC Using In-Phase Gate-Boosting Rectifier
- **Advisor:** Prof. Yu-Jiu Wang

National Chiao Tung University　　　　　　　　　　　　　　　　　　　Hsinchu, Taiwan
Bachelor of Science in Electronics Engineering; GPA: 88.72/100 (4.03/4.3)　　　*Sept. 2008 – June 2012*
- **CS-related coursework:** Computer Programming (I) and (II), Linear Algebra, Probability and Statistics, Data Structures, Algorithms, Data Mining, Computer Organization

SKILLS

Languages　　　Python (15,000+ lines), C/C++ (10,000+ lines), Matlab, Cadence Skill Code
Framework/Tools　　　TensorFlow, Keras, Scikit-learn, OpenCV, Django, NumPy, Pandas, Git

EXPERIENCE

Advanced Database System Lab, National Chiao Tung University　　　　　Hsinchu, Taiwan
Research Assistant (Advisor: Prof. Wen-Chih Peng)　　　　　　　　　　*Aug. 2018 – Present*
- CoachAI: Badminton Strategy Analysis Project
  - Developed TrackNet, a deep learning model based on CNN and DeconvNet, for high-speed and tiny object tracking in sport videos. The work is presented here: https://inoliao.github.io/CoachAI/
  - Achieved 85% badminton tracking precision in broadcast videos by the proposed TrackNet.
  - Developed a game strategy recommender system based on classification and clustering.
  - Built a database to store data of badminton trajectories and stroke types for fast data retrieval.
  - Mentored 4 undergraduate students to learn Deep Learning and Data Mining from the project.

MediaTek Inc.　　　　　　　　　　　　　　　　　　　　　　　　　Hsinchu, Taiwan
RF System Design Engineer　　　　　　　　　　　　　　　　　　　*Dec. 2014 – Dec. 2017*
- Digital Pre-Distortion (DPD) Algorithm Design for 4G-LTE and 5G-NR Mobile Phone Applications
  - Achieved 15% power reduction on Power Amplifier by DPD.
  - Reduced 50% DPD hardware area by using interpolation to reduce the size of look-up tables.
  - Reduced 80% calibration time by applying an adaptive mechanism to skip pre-calibration.
  - Published one US patent regarding the adaptive pre-distortion mechanism.

- Automatic MLDPD Verification Platform Development
  - Developed a Matlab-based automatic verification API to verify MLDPD on smartphones.
  - Established an object-oriented MLDPD simulation framework to speed up algorithm development.
  - Increased 80% verification and simulation speed by adopting slicing and parallel computing.

- RF System Design for 4G-LTE and 5G-NR Applications
  - Optimized RF front-end, RF transceiver, and digital front-end specifications to maximize the competitiveness of MediaTek's cellular products.

RFVLSI Lab, National Chiao Tung University   Hsinchu, Taiwan
Graduate Student (Advisor: Prof. Yu-Jiu Wang)   *Sept. 2012 – Sept. 2014*

- Circuit Design Optimizer (CDO)
  - Proposed the CDO algorithm to optimize IC design parameters and model fitting.
  - Reduced IC developing time by at least 50% using CDO.

- A Millimeter-Wave In-Phase Gate-Boosting Rectifier (IGR)
  - Designed a 60-GHz RF rectifier that achieved the peak efficiency of 21% and input sensitivity of -7 dBm. Efficiency and sensitivity were improved by 13% and 9 dBm compared to previous works.
  - Published the work on two IEEE papers and one US patent.

- A Millimeter-Wave RFID Passive Tag IC
  - Designed a compact 1 mm^2 RFID tag with the on-chip antenna by increasing the operating frequency and adopting the proposed high-efficiency IGR.
  - Reduced the RFID tag cost by 75% by designing a low-cost on-chip loop antenna.

PROJECTS

NBA Game Prediction System   *Feb. 2018 – Present*

- Developed a crawler program in Python to collect NBA data from the website automatically.
- Achieved 76.8% NBA game prediction accuracy in 2017-18 playoffs by the proposed composite 2-stage stacking model consisting of SVM, GBDT, XGBoost, and AdaBoost.
- Built a word cloud generator to represent features of each NBA team by text mining on forums.

PUBLICATIONS

- Yu-Chuan Huang, **I-No Liao**, Ching-Hsuan Chen, Tsì-Uí İk, Wen-Chih Peng, "TrackNet: A Deep Learning Network for Tracking High-speed and Tiny Objects in Sport Applications", *Proceedings of the 25th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining KDD '19* (Submitted)
- Chao-Han Tsai, **I-No Liao**, Chatrpol Pakasiri, Hsin-Cheng Pan, Yu-Jiu Wang, "A Wideband 20 mW UHF Rectifier in CMOS", *IEEE Microw. Wireless Compon. Lett.*, vol. 25, no. 6, pp. 388-390, Jun. 2015.
- Yu-Jiu Wang, **I-No Liao**, Chao-Han Tsai, Chatrpol Pakasiri, "A Millimeter-Wave In-Phase Gate-Boosting Rectifier", *IEEE Trans. Microw. Theory Tech.*, vol. 62, no. 11, pp. 2768-2783, Nov. 2014.

PATENTS

- Po-Sen Tseng, Wei-Kai Chang, **I-No Liao**, Tzyuan Shiu, Hsin-Hung Chen, Caiyi Wang, "Adaptive Power Amplifier Supply with Pre-distortion Mechanism", U.S. Patent US20170214370A1, July. 27, 2017.
- Yu-Jiu Wang, **I-No Liao**, Chao-Han Tsai, Chatrpol Pakasiri, "Current-rectifying device, gate-boosting rectifier and method of permitting current to flow in one direction when driven by AC input voltage", U.S. Patent US20150194907A1, July. 9, 2015.

HONORS AND AWARDS

- 2015-2017, MediaTek Inc. VAwards, three times