

Gang Chen

RESEARCH ENGINEER

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Education

University of California, Davis

California

PH.D IN ROBOTICS (MINOR: MATHEMATICS)

2020

- Thesis: "Human-Computer Collaborative Specification, Analysis, and Design of Safety-Assured Cyber-Physical Systems".

Shanghai Jiao Tong University

Shanghai

M.S. IN MECHANICAL ENGINEERING

2015

- Thesis: "Study On Feature Selection Methods and Its Application to Rolling Element Bearing Fault Diagnosis".

Shanghai Jiao Tong University

Shanghai

B.S. IN MECHANICAL ENGINEERING AND AUTOMATION

2012

- Thesis: "LVDT based Nanometer Measurement System Design and Implementation".

Honors & Awards

2019	Departmental Fellowship , Academic Performance	Davis, CA
2018	Departmental Fellowship , Academic Performance	Davis, CA
2018	Student Travel Award , Academic Performance	Davis, CA
2015	Outstanding Graduate Award , Academic Performance	Shanghai, China
2014	National Scholarship , Academic Performance	Shanghai, China
2014	Best Paper Award , Graduate Academic Forum of Shanghai Jiao Tong University	Shanghai, China
2013	First Class Scholarship , China Aerospace Science and Technology Corporation	China
2012	Outstanding Graduate Award , Academic Performance	Shanghai, China
2011	Academic Excellence Scholarship , Academic Performance	Shanghai, China
2010	2nd-Prize , National University Student Contest on Energy Saving and Emission Reduction	China
2010	Outstanding Volunteer , Shanghai EXPO	Shanghai, China
2010	Academic Excellence Scholarship , Academic Performance	Shanghai, China
2009	Academic Excellence Scholarship , Academic Performance	Shanghai, China

Experience

SenseTime

Shenzhen, China

RESEARCH INTERN

August 2019 - Oct. 2019

- Developed an algorithm to falsify the decision and planning modular for autonomous vehicles.
- Found some failure modes of the autonomous vehicles.

Hyundai Center of Excellence in Vehicle Dynamic Systems & Control

Davis, CA

RESEARCH ENGINEER

March 2018 - Sept. 2018

- Developed a user interface for behavior understanding and improved the efficiency of the engineers.
- Published some papers about machine learning, system design, and control of automobiles.
- Analyzed the user behavior and mined the user requirements.

University of California, Davis

Davis, CA

RESEARCH ASSISTANT

Sept. 2015 - present

- Developed some Bayesian modeling tools and methods for system verification.
- Published some papers about machine learning, formal method, and applications to Cyber-physical systems.
- Present our research in many conferences and workshops.

University of California, Davis

Davis, CA

TEACHING ASSISTANT

Jan. 2016 - present

- Obtained high evaluation from the students when Led discussion classes in system dynamic and fluid mechanism classes.
- Successfully supervised research projects for the senior design class.
- Gave lectures in system dynamic and fluid mechanism classes.

Philips (China) Investment Co.,Ltd

SOFTWARE ENGINEER

Shanghai, China

April. 2015 - Sept. 2015

- Developed a software platform for monitoring the light intensity along a road with a user-friendly manner.
- Developed a hardware system to sample the light intensity for a user experience system.
- Analyzed the user experience experiment data by a statistical analysis method.

State Key Laboratory of Mechanical System and Vibration

GRADUATE RESEARCH FELLOW

Shanghai, China

Sept. 2013 - Jan. 2015

- Developed some machine learning and signal processing algorithms to high accuracy pattern recognition.
- Published some papers in condition monitoring and machine learning on the top journal.
- Designed a data sampling platform to collect vibration signals, which including the hardware and software system.
- Applied my algorithm to mechanical system monitoring and fault diagnosis, EEG signal analysis and mild cognitive impairment diagnosis.

Shanghai Automation Equipment Co., Ltd

HARDWARE ENGINEER

Shanghai, China

Jan. 2012 - Aug. 2012

- Developed a hardware system for the signal processing for an LVDT sensor to improve the measurement resolution and range, including the PCB and mechanical system.
- Developed a control algorithm for high performance of the LVDT system in nano-displacement measurement.

Conference Papers

[08] **Gang Chen**, Mei Liu and Zhaodan Kong, Semantic inference for Cyber-Physical Systems with signal temporal logic, *58th IEEE Conference on Decision and Control (CDC)*, Nice, France, 2019.

[07] **Gang Chen**, Zachary Sabato, and Zhaodan Kong, Semantic Parsing of Automobile Steering Systems, *International Workshop on Human-in-Loop Internet of Things Systems (HiL-IoT)*, Santa Barbara, CA, 2018.

[06] Mei Liu and **Gang Chen**, Partial-fraction expansion of lossless negative imaginary property and a generalized lossless negative imaginary lemma, *57th IEEE Conference on Decision and Control (CDC)*, Miami Beach, FL, 2018.

[05] **Gang Chen** and Zhaodan Kong, Data-driven approximate abstraction for black-box piecewise affine systems, *American Control Conference (ACC)*, Milwaukee, WI, 2018.

[04] **Gang Chen** and Zhaodan Kong, Correct-by-construction approach for self-evolvable robots, *IEEE/ASME International Conference on Mechatronic and Embedded Systems and Applications*, Cleveland, OH, 2017.

[03] **Gang Chen**, Zachary Sabato, and Zhaodan Kong, Active learning based requirement mining for Cyber-Physical Systems, *55th IEEE Conference on Decision and Control (CDC)*, Las Vegas, NV, 2016.

[02] **Gang Chen**, et al. A Bayesian based criterion for feature selection and its application to fault diagnosis, *National Monitoring and Diagnostic Equipment and Maintenance Conference*, Qinhuangdao, 2014.

[01] H.M. Jiang, J. Chen, G. Dong, T. Liu and **Gang Chen**, A hybrid feature selection method for hidden Markov model based bearing performance assessment, *27th International Congress of Condition Monitoring and Diagnostic Engineering*, Australia, 2014.

Workshop

[02] Co-design of controller and physical system with spectral logic specifications, CITRIS/CPAR Control Theory and Automation Symposium | 2nd NorCal Control Workshop.

[01] Formal Interpretation of Cyber-Physical System Performance with Temporal Logic, CITRIS/CPAR Control Theory and Automation Symposium | 1st NorCal Control Workshop.

Journal Papers ([Link to Google Scholar](#))

[14] **Gang Chen** and Mei Liu, Shapelet Temporal Logic: An Expressive Formal Language for Time Series Classification, *Neurocomputing*, submitted.

[13] **Gang Chen** and Zhaodan Kong, SMT-Based Time Failure Propagation Graph Refinement for Complex System Diagnosis, *IEEE Control Systems Letters*, submitted.

[12] **Gang Chen** and Zhaodan Kong, Temporal-logic-based Semantic Fault Diagnosis for Industrial Internet of Things, *IEEE Transactions on Industrial Electronics*, under review.

[11] **Gang Chen** and Zhaodan Kong, Co-design of output feedback law and linear systems with spectral logic specifications, *Automatica*, major revision.

[10] **Gang Chen**, Mei Liu, and Jin Chen, Frequency-temporal-logic-based Bearing Fault Diagnosis and Fault Interpretation using Bayesian Optimization with Bayesian Neural Networks, *Mechanical Systems and Signal Processing*, revision submitted.

- [09] Mei Liu, Xingjian Jing, and **Gang Chen**, Necessary and sufficient conditions for lossless negative imaginary systems, *Journal of The Franklin Institute*, accepted.
- [08] April L. Teske, **Gang Chen**, Christian Nansen and Zhaodan Kong, Natural enemies dispensed by multirotor UAVs in wind: a distribution pattern modeling approach for precision agriculture, *Biosystem Engineering*, 187, 226-238.
- [07] **Gang Chen**, Zachary Sabato, and Zhaodan Kong, Formal interpretation of Cyber-Physical System performance with temporal logic inference, *Cyber-Physical Systems*, 4(3), 175-203, 2018.
- [06] **Gang Chen**, Jin Chen, A novel wrapper method for feature selection and its applications, *Neurocomputing*, vol.159, pp.219-226, 2015.
- [05] **Gang Chen**, Bo Zhang, Pinkuan Liu and Han Ding, An adaptive analog circuit for LVDT's nanometer measurement without losing sensitivity and range, *IEEE Sensors Journal*, vol.15, no.4, pp. 2248–2254, 2015.
- [04] **Gang Chen**, Jin Chen, G.M. Dong, and H.M. Jiang, An adaptive non-parametric short-time Fourier transform: application to echolocation, *Applied Acoustics*, vol. 87, pp. 131-141, 2015.
- [03] **Gang Chen**, Jin Chen, and G.M. Dong, Chirplet Wigner–Ville distribution for time–frequency representation and its application, *Mechanical Systems and Signal Processing*, vol. 41, pp. 1-13, 2013.
- [02] **Gang Chen**, Bo Zhang, and P.K. Liu, Design and Implement of a nanometer displacement measurement system based on LVDT, *Automation and Instrumentation*, vol. 27, pp. 1-4, 2012.
- [01] H.M. Jiang, Jin Chen, G. Dong, T. Liu, and **Gang Chen**, Study on Hankel matrix-based SVD and its application in rolling element bearing fault diagnosis, *Mechanical Systems and Signal Processing*, vol.52, pp.338-359, 2015.

Program Committees

2018 **Session co-chair**, 57th IEEE Conference on Decision and Control.

FL, USA

Professional Service

AD HOC REVIEWERS

- Mechanical Systems and Signal Processing.
- IEEE Transactions on Industrial Informatics.
- Neurocomputing.
- IEEE Transactions on Systems, Man and Cybernetics.
- Journal of Biostatistics and Biometric Applications.
- Systems Science and Control Engineering.
- IEEE Transactions on Instrumentation and Measurement.
- IEEE Transactions on Industrial Electronics.
- Measurement.