

# Shuo Yang

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## RESEARCH INTEREST

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**Systems and Control, Discrete-Events System, Formal Methods, Game Theory, Cyber-Physical Systems, and Motion Planning.**

## EDUCATION

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**Shanghai Jiao Tong University**

Department of Automation

- Major GPA: 88.1/100
- Member of **Key Laboratory of System Control and Information Processing**
- Advisor: Prof. Xiang Yin (<http://xiangyin.sjtu.edu.cn/>)

*Shanghai, China*

*2017 – 2021 (Expected)*

**University of Illinois at Urbana-Champaign**

Summer School Student

*Urbana, Illinois, USA*

*July 2019*

## PUBLICATIONS & PREPRINTS

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### [1] Opacity of Networked Supervisory Control Systems over Insecure Communication Channels

*Submitted to IEEE Transactions on Control of Network Systems, under review, 2020*

Shuo Yang, Junyao Hou, Xiang Yin, Shaoyuan Li.

- Propose a new framework for investigating the **security issue** in networked supervisory control systems over **multiple channel networks**
- Construct **network observer** to verify current-state opacity
- Generalize network observer to the **two-way network observer** to verify infinite-step and  $K$ -step opacity

### [2] Secure-by-Construction Optimal Path Planning for Linear Temporal Logic Tasks

*Submitted to IEEE Conference on Decision and Control (CDC 2020), under review, 2020*

Shuo Yang, Xiang Yin, Shaoyuan Li, Majid Zamani.

- Investigate the problem of planning an optimal infinite path for a single robot to achieve a **linear temporal logic task** with **security guarantee**
- Construct the **twin weighted transition systems** to track a pair of paths having the same observation
- Propose a **sound and complete** algorithmic procedure, which is **polynomial** in the size of the system model

## RESEARCH EXPERIENCES & PROJECTS

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**Shanghai Jiao Tong University, Key Laboratory of System Control and Information Processing**

*Shanghai, China*

Undergraduate Research Assistant with **Prof. Xiang Yin**

*Feb. 2019 - Present*

- My research topic focuses on the **security issue in supervisory control systems** and **path planning**
- Security issue over **insecure multiple channel networks**
- Optimal path planning for LTL tasks under initial-state security constraint
- Supervisory synthesis for security in supervisory control systems (in progress)
- Security issue of active adversary in supervisory control systems (in progress)
- Optimal path planning for LTL tasks under infinite-step opacity constraint (in progress)

**Shanghai Jiao Tong University, CyberC3 Intelligent Vehicle Labs**

*Shanghai, China*

Coursework Project with Prof. Ming Yang

*Feb. 2019 - May 2019*

- Design algorithms to control the intelligent vehicle in the virtual environment **CyberTORCS**
- Three parts: tracking the center line, following the head car, and parking our car
- Utilize **PID control** and some **physical models**
- Our team won the **first prizes** of tracking center line and following head car (total 36 teams)

**Shanghai Jiao Tong University**

*Shanghai, China*

Coursework Project with Prof. Yue Gao

*Nov. 2019 - Dec. 2019*

training video: <https://www.youtube.com/watch?v=kB94Cag8gj4&feature=youtu.be>

- Sample efficient optimization for biped locomotion
- Train robot NAO to learn to walk in simulation platform V-REP and transform the optimal policy to real robot

- Implement random search, genetical algorithms and **bayesian optimization** to reduce samples in the training process, respectively

## Shanghai Jiao Tong University

Coursework Project with Prof. Enmei Tu

Shanghai, China

Dec. 2019

- Predicting NBA games (both regular seasons and playoffs) by using machine learning methods
- Do feature selection and give the **upper bound analysis** of accuracy rate
- Propose our combined model: accuracy rates for regular seasons and playoffs are 67.6% and 63.4%

## AWARDS AND HONORS

2020	<b>UCLA-CSST Summer Research Program Offer</b> Suspended due to COVID-2019; about 90 offers among China and Japan totally.	University of California, Los Angeles
2019	<b>Winner Team of Intelligent Vehicle Races (top3%)</b> University-Wide on Intelligent Vehicle Races	Shanghai Jiao Tong University
2019	<b>C Level Excellent Scholarship (top20%)</b> Awarded to students with excellent academic achievements	Shanghai Jiao Tong University
2018	<b>3rd prize, National College Student Physics Competition</b> Nation-Wide contest on physical ability	Shanghai Physical Society
2018	<b>B Level Excellent Scholarship (top10%)</b> Awarded to students with excellent academic achievements	Shanghai Jiao Tong University
2018	<b>Three good students (top10%)</b> Awarded to students with excellent achievements	Shanghai Jiao Tong University
2016	<b>3rd Prize, National High School Mathematics Competition</b> Nation-Wide contest on mathematics ability	Chinese Mathematics Society

## TEACHING EXPERINCES

- Final exam review lecturer of **Linear Algebra**, Shanghai Jiao Tong University  
Instructor: Prof. Qifen Jiang  
Shanghai, China  
Fall 2017
- **Mathematics Competition** Lecturer, High School Affiliated to Shanghai Jiao Tong University  
Shanghai, China  
Summer 2018

## ACTIVITY EXPERIENCES

- Volunteer of the 23rd Shanghai International Marathon  
2018
- Volunteer of the 122nd Anniversary Celebration of Shanghai Jiao Tong University  
2018
- Volunteer of the 24th Shanghai International Marathon  
2019
- Volunteer of the 123rd Anniversary Celebration of Shanghai Jiao Tong University  
2019

## LANGUAGE, SKILLS AND INTRERESTS

<b>Language:</b>	Mandarin (native), English (fluent)	<b>Embedded Systems:</b>	Arduino, STM32
<b>Programming:</b>	Python, C++, Linux, MATLAB, Verilog, HTML	<b>Deep Learning:</b>	Keras, PyTorch
<b>Simulation:</b>	SIMULINK, Multisim	<b>Robotic Platform:</b>	V-REP, ROS
<b>Interests:</b>	Basketball, Literature, Music, Martial Arts, and Movies.		