Shuo Yang

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RESEARCH INTEREST

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

EDUCATION

Shanghai Jiao Tong University *Shanghai, China*
Department of Automation *2017 – 2021 (Expected)*

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

University of Illinois at Urbana-Champaign *Urbana, Illinois, USA*
Summer School Student *July 2019*

PUBLICATIONS & PREPRINTS

[1] Opacity of Networked Supervisory Control Systems over Insecure Communication Channels
Submitted to IEEE Transactions on Control of Networked 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

Shanghai Jiao Tong University, Key Laboratory of System Control and Information Processing
Shanghai, China
Undergraduate Research Assistant with Prof. Xiang Yin *May 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=kB94Caq8gj4&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 *Shanghai, China*
Coursework Project with Prof. Enmei Tu *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 **UCLA-CSST 2020 Summer Research Program Offer** *University of California, Los Angeles*
Suspended due to COVID-2019; about 90 offers among China and Japan totally.

2019 **Winner Team of Intelligent Vehicle Races (top3%)** *Shanghai Jiao Tong University*
University-Wide on Intelligent Vehicle Races

2019 **C Level Excellent Scholarship (top20%)** *Shanghai Jiao Tong University*
Awarded to students with excellent academic achievements

2018 **3rd prize, National College Student Physics Competition** *Shanghai Physical Society*
Nation-Wide contest on physical ability

2018 **B Level Excellent Scholarship (top10%)** *Shanghai Jiao Tong University*
Awarded to students with excellent academic achievements

2018 **Three good students (top10%)** *Shanghai Jiao Tong University*
Awarded to students with excellent achievements

2016 **3rd Prize, National High School Mathematics Competition** *Chinese Mathematics Society*
Nation-Wide contest on mathematics ability

TEACHING EXPERINCES

- Final exam review lecturer of **Linear Algebra**, Shanghai Jiao Tong University *Shanghai, China*
  Instructor: Prof. Qifen Jiang *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

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