YEDI ZHANG

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CURRENT RESEARCH INTEREST

logic and automata theory, formal methods, model checking, verification
multiagent systems, safety/security of systems with learning-enabled components

EDUCATION

ShanghaiTech University *Shanghai, China*
Ph.D. in Computer Science *Oct. 2020 - Present*
Advisor: Prof. Fu Song

ShanghaiTech University *Shanghai, China*
M.S. in Computer Science *Sept. 2017 - July 2020*
Advisor: Prof. Fu Song

Beijing University of Posts and Telecommunications *Beijing, China*
B.E. in Communication Engineering *Sept. 2013 - July 2017*
Thesis title: *Temporal Epistemic Logic: Semantics and Model-Checking*

PUBLICATIONS

Refereed Journal Articles

1. Reasoning about Strategic Abilities in Stochastic Multiagent Systems. **Yedi Zhang**, Fu Song, Taolue Chen, Zhiwu Xu. Submitted to **FAOC**, 2020.
2. Making Agents Abilities Explicit. **Yedi Zhang**, Fu Song and Taolue Chen. **IEEE Access**, vol. 7, pp. 101804-101819, 2019.
3. Model-Checking for Heterogeneous Multi-agent Systems (In Chinese). **Yedi Zhang** and Fu Song. Journal of Software (**JOS**), volume 29(6), 2018.

Refereed Conference Papers

4. BDD4BNN: A BDD-based Quantitative Analysis Framework for Binarized Neural Networks. **Yedi Zhang**, Zhe Zhao, Guangke Chen, Fu Song, Taolue Chen. International Conference on Computer-Aided Verification (**CAV**). Los Angeles, USA, 2021.
5. Probabilistic Alternating-Time Mu-Calculus. Fu Song, **Yedi Zhang**, Yu Tang, Taolue Chen and Zhiwu Xu. Proceedings of the Thirty-Third AAAI Conference on Artificial Intelligence (**AAAI**). Honolulu, Hawaii, 2019. (**Oral presentation, Acceptance rate: 16%**)

PROJECTS & RESEARCHING EXPERIENCE

Software Design of A DDD Pacemaker
In this course project, I designed a safe DDD pacemaker with UPPAAL and Matlab by following 4 steps:

1. Created different heart models according to different heart conditions, including NSR, Sinus Bradycadia, Sinus Tachycardia and AV Block;
2. Designed a DDD pacemaker in UPPAAL, which satisfies some basic requirements, like no deadlocks, guaranteeing the heart beating in the normal range;

3. Translated the UPPAAL model into Matlab Code, and maintained the traceability between physiological requirements to code implementation;
4. Designed testing cases to make sure that the verified UPPAAL model was implemented correctly.

Here is the source code.

Market Predictions
In this course project, our objective is to determine which set of customers the marketing firm should contact in order to maximize the profit, and explore the profit that each customer would give to the company in the further. To achieve that, we first recovered the customer's personal information, then recovered the missing data from the rest features. Finally, we regarded it as a classification problem and utilized some basic machine learning algorithms to solve it. Here is the source code.

Probabilistic Alternating-time Temporal Logics
In this research work [1,5], we proposed a probabilistic extension of Alternating μ-Calculus (PAMC) to reason about strategic abilities of agents in stochastic multiagent systems. We studied the expressiveness of PAMC, as well as two fundamental problems: model checking and satisfiability. Finally, we proposed and implemented the model checking algorithms in a tool ePMC-PAMC and the satisfiability decision procedure in a solver PAMCSolver.

Verify Heterogeneous Multiagent Systems with ATL/ATL*
In this research work [2,3], we proposed a new concurrent game structure where agents' abilities were defined on the syntactic level. Specifically, we studied ATL/ATL* over this new model and gave formal definitions of the new semantics in such settings. We also presented model-checking algorithms for ATL/ATL* and implemented them in a prototype tool MCMAS-ACGS.

RESEARCH VISIT

Universität des Saarlandes, Dependable Systems and Software group *Saarbrücken, Germany*
Academic Visitor, Visiting Graduate Student *Oct. 2019 - Mar. 2020*

HONORS AND AWARDS

ShanghaiTech University Excellent Student *Dec. 2020*
CSC-IBM Excellent Chinese Student Scholarship *May 2020*
ShanghaiTech University Merit Student *July 2019*
AAAI 2019 Travel Grant *Dec. 2018*
Meritorious Winner, ICM *Apr. 2016*

TEACHING EXPERIENCE & INTERNSHIPS

ShanghaiTech University *Shanghai, China*
Teaching Assistant, Theory of Computation (Fall'20) *Sept. 2020 - Present*

ShanghaiTech University *Shanghai, China*
Teaching Assistant, Theory of Computation (Spring'19) *Feb. 2019 - June 2019*

ShanghaiTech University *Shanghai, China*
Teaching Assistant, Introduction to Programming (Fall'18) *Sept. 2018 - Jan. 2019*

Huawei Beijing R&D Center *Beijing, China*
Intern, Software Engineer *July 2016 - Aug. 2016*

ACTIVITIES

Sub-reviewer of ICECCS 2019 *July 2019*
Student Volunteer at CONFESTA 2018, Beijing, china *Sept. 2018*
Student Volunteer at SSIST 2018, Shanghai, china *July 2018*