Zang, Zhiqiang

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Objective: SDE/Research Intern

Education

The University of Texas at Austin — Austin, TX, U.S.

Ph.D. in Software Engineering and Systems GPA: 3.83/4.00 — Aug 2018 – Present

Beijing University of Posts and Telecommunications — Beijing, P.R. China

B.S. in Telecommunication Engineering GPA: 91/100 Rank: 11/556 — Sep 2014 – Jun 2018

Internship

NIO — Beijing, P.R. China

Simulator for Autonomous Vehicles — Jul 2019 – Aug 2019

AirSim, Unreal Engine, Simulator Mentor: Zhuo Cheng

Brief: This project aims to develop a physical and visual simulator for autonomous vehicles, as a platform for AI research to experiment with deep learning, computer vision and reinforcement learning algorithms for autonomous vehicles.

- Extracted/refactored core modules (sensor models, physics engine) and created a workflow of adding new APIs to retrieve data and control vehicles in the simulator, contributing to the corporate internal documentation

Publications

VeDebug: Regression Debugging Tool for Java

B. Buhse, T. Wei, Z. Zang, A. Milicevic, and M. Gligoric, "VeDebug: Regression debugging tool for Java," in *2019 IEEE/ACM 41st International Conference on Software Engineering: Companion Proceedings*. IEEE Press, 2019, pp. 15–18

Research

The University of Texas at Austin — Austin, TX, U.S.

Research Assistant Advisor: Milos Gligoric

JaCoCo's Runtime Overhead Evaluation and Analysis — Feb 2019 – Apr 2019

Testing, Dynamic Program Analysis, Code Coverage

Brief: This project aims to measure and analyze time overhead of JaCoCo, which is a popular tool to collect code coverage, and finally to explore how to reduce the overhead.

- Developed automation scripts configurating and running JaCoCo on 13 open-source projects to evaluate its runtime overhead
- Analyzed implementation of JaCoCo by dynamic program analysis using ASM bytecode manipulation library and found a potential optimizable direction of reducing time overhead

VeDebug: Regression Debugging Tool for Java Aug 2018 – Nov 2018
Debugging, Dynamic Program Analysis, ASM

Brief: VeDebug is a video-based time-travel regression debugging tool to advance users' debugging experience. A unique feature is automatically setting a "divergence breakpoint" wherever the control flow of the current execution diverges from the flow of a previously captured execution. Demo link

- Migrated VeDebug to a mainstream Java version, fixed bugs on core features and implemented a bonus feature to record the history of objects
- Collected and analyzed time overhead of VeDebug over different phases (instrumentation, IO, execution, etc.) with running over open-source projects

Beijing University of Posts and Telecommunications Beijing, P.R. China

Cooperative spectrum sensing based on machine learning Apr 2016 – Mar 2017
Machine Learning, Signal Processing Advisor: Wenjun Xu

- Applied clustering/classification algorithms (K-Means, GMM, SVM and KNN) to cooperative spectrum sensing improving the detection accuracy by 50%

Projects

Building Real-Time Strategy Game AI Dec 2017 – May 2018
Object Detection, Deep Learning, Game AI Advisor: Xiaosheng Tang

Brief: RABot AID is an AI agent (bot) for real-time strategy game *Command & Conquer: Yuri's Revenge*. It plays the game like the human: watches by acquiring real-time screenshots of the game, decides by analyzing the screenshots and acts by controlling keyboard and mouse. Experiments showed that RABot AID can defeat the AI embedded in the game under fixed conditions with a win rate of over 80%. Demo link

- Collected image data from game videos and then preprocessed, labeled and augmented the data using Python with OpenCV
- Analyzed dynamic battlefield by building a SSD model using TensorFlow Object Detection API while recognizing static sidebar via template matching
- Implemented in-game commands (build, move, attack) by combining image recognition and keyboard/mouse simulation, thus supporting advanced game strategy execution

Awards

Undergraduate Top Prize Scholarship of BUPT Nomination (0.6%)	Nov 2017
First Prize Scholarship of BUPT	Nov 2017
Qualcomm Innovation Scholarship (0.8%)	Dec 2015 & 2016
Second Prize Award for National College Students Mathematical Competition	Nov 2015

Skills

- Programming Languages: Java, Bash, Python, C/C++
- Tools: Emacs, Git, Maven, Gradle, Make
- Platform: Linux