Zang, Zhiqiang

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https://github.com/cptgit
https://rocketeer.buptra.net/

Education

The University of Texas at Austin Austin, TX, U.S.
M.S. in Software Engineering and Systems Aug 2018 – Present
GPA: 3.83/4.00

Beijing University of Posts and Telecommunications Beijing, P.R. China
B.S. in Telecommunication Engineering Sep 2014 – Jun 2018
GPA: 91/100 Rank: 11/556 (2%)

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, ASM

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

- Migrated VeDebug to a mainstream Java version, fixed bugs on core tracking features and implemented a bonus feature to record the history of objects
- Collected and analyzed time overhead over different phases (instrumentation, IO, execution, etc.) using dynamic program analysis and automation scripts
- Developed automation scripts to deploy and run VeDebug over open-source projects to evaluate its time overhead

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

Building Real-Time Strategy Game AI Dec 2017 – May 2018
Object Detection Deep Learning Game AI Senior Design, 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 analyzing static sidebar via template matching
- Implemented in-game commands (build, move, attack) by combining image analysis and recognition and keyboard and mouse simulation, thus supporting advanced game strategy execution

Cooperative spectrum sensing based on machine learning Apr 2016 – Mar 2017
Machine Learning, Signal Processing Key Laboratory of Universal Wireless Communications, Ministry of Education, Advisor: Wenjun Xu

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

Sandpainting App Jun 2015 – Apr 2016
Android, Image Processing National Training Program of Innovation and Entrepreneurship for Undergraduates

- Developed an sandpainting filter and packaged it into an Android app, winning a prize at the Province Achievement Level.

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 *International Conference on Software Engineering, Demo Papers*. IEEE Computer Society, 2019, p. to appear

TEACHING

EE 422C Software Design and Implementation II Spring 2019
Teaching Assistant The University of Texas at Austin, U.S.

AWARDS

Undergraduate Top Prize Scholarship of BUPT Nomination (0.6%) Nov 2017
The First Prize Scholarship of BUPT (5%) Nov 2017
Qualcomm Innovation Scholarship (0.8%) Dec 2015 & 2016
The Second Prize Award for the National College Students Mathematical Competition (10%) Nov 2015

SKILLS

- Programming Languages: Java, Bash, Python, MATLAB, C/C++
- Tools: Emacs, Git, LaTeX
- Platform: Linux