Yongbo Chen

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Personal Website: https://cybersakura.github.io/

Education

- **Tulane University** — Aug. 2024 – Present
  Ph.D. in Computer Science, GPA: 3.95/4.00 — New Orleans, LA
- **University of California, Irvine (UCI)** — Sep. 2022 – Jun. 2024
  M.S. in Software Engineering, GPA: 3.94/4.00 — Irvine, CA
- **The Ohio State University (OSU)** — Aug. 2018 – May 2022
  B.S. in Computer Science and Engineering, GPA: 3.67/4.00 — Columbus, OH

Programming Languages: Java, SQL, Python, C/C#, MATLAB, HTML, Ruby
Tools & Frameworks: Git, PostgreSQL, Unity 3D, Android Studio, IntelliJ IDEA, Postman

Research Experience

Breaking Strong Encapsulation (BSE): A Comprehensive Study of Java Module Abuse Dec. 2023 – May 2024
Master's, supervised by Dr. Joshua Garcia, Informatics Department, UCI

- Conducted a systematic study on the BSE problem in JPMS to improve software security.
- Designed a GitHub crawler to collect 4,079 issues, consolidated datasets, and analyzed BSE problems' types, features, and commonly accessed modules.
- Explored mitigation strategies; results published in ICSE 2026.

BEAD: Breaking Encapsulation Abuse Detector Dec. 2023 – May 2024
Master's Thesis Project, supervised by Dr. Joshua Garcia, Informatics Department, UCI

- Developed an automatic detection tool leveraging static analysis to identify encapsulation abuse instances in Java projects.
- Implemented static analysis to extract module/package details and detect abuse information from reflection and compile-time invocations.
- Produced *Automatic Detection of Breaking Strong Encapsulation in Java Modules* as Master's Thesis (UC Irvine, 2024).

Empirical Study of Software Architectural Modularization in Java Systems Apr. 2023 – Dec. 2023
Master's Student Researcher, supervised by Dr. Joshua Garcia, Informatics Department, UCI

- Researched architectural modularization problems of JPMS introduced in Java 9 through software architecture analysis.
- Implemented ecosystem-aware detection of module decay in evolving Java frameworks using the DARCY approach.
- Analyzed framework architectures and module calls to evaluate exposure appropriateness and detect over-exposure effects.
- Performed a comparative study on over-exposure problems of Java frameworks.

A New Vehicle Distance Measure Method Based on the License Plate with Image Edge Detection and Color Recognition May 2021 – Jul. 2021
Undergraduate Research Intern, supervised by Dr. Munib Wober, Digital Image Processing and Segmentation Online Research Seminar, Harvard University

- Developed a novel method combining edge detection and color detection in MATLAB for license plate detection and vehicle distance measurement.
- Reduced noise using edge detection and color filtering, constructed a blue color distance matrix, and applied binarization with minimum bounding box.
- Used least-square error correction to detect license plates and measure distances with high accuracy (mean error: 0.0428).
- Co-authored paper published in EIECS 2021.

Publications

- Y. He, **Y. Chen**, J. Ayala, et al. *Breaking Strong Encapsulation: A Comprehensive Study of Java Module Abuse*. To appear in Proceedings of the 48th International Conference on Software Engineering (ICSE), May 2026. [Accepted at ICSE 2026]
- **Y. Chen**. *Automatic Detection of Breaking Strong Encapsulation in Java Modules*. Master's Thesis, University of California, Irvine, May 2024. ProQuest ID: Chen_uci_0030M_19065. [ProQuest Link]
- **Y. Chen**, Z. Lu, H. Wang, and H. Zhang. *A New Vehicle Distance Measure Method Based on the License Plate with Image Edge Detection and Color Recognition in the Complex Environment*. In Proceedings of the International Conference on Electronic Information Engineering and Computer Science (EIECS), Sep. 2021, pp. 225–231. doi: 10.1109/EIECS53707.2021.9587943

Academic Projects

- **CodeMentor – Intelligent Learning Support Platform** Sep. 2024 – Dec. 2024
  - Collaborated on building an AI-assisted programming education platform integrating ChatGPT for interactive tutoring.
  - Conducted user research (interviews + surveys) with diverse participants; applied thematic analysis to extract learning pain points.
  - Designed personas, task scenarios, and low- & high-fidelity prototypes; applied Nielsen's heuristics for usability evaluation.
  - Led heuristic evaluation and user testing (4 participants), identified major design issues, and refined prototypes.
  - Implemented a Node.js web prototype with lesson navigation, adaptive chat tutoring, and basic progress tracking.
- **Impacts of Dark Patterns on Blind Users** Jan. 2023 – Mar. 2023
  - Collected 135 Android apps, emulated with Google Pixel 4 API 33, and recorded 459 dark patterns.
  - Categorized patterns into five types: nagging, obstruction, sneaking, interface interference, and forced action.
  - Analyzed Google TalkBack accessibility mechanics, discussed detection issues, and classified patterns into three impact levels for blind users.
- **Literature Survey on Strategies of Microservice Architecture (MSA) Recovery** Oct. 2022 – Dec. 2022
  - Studied key MSA concepts and quality metrics including coupling, cohesion, and complexity.
  - Compared pattern-based and model-based recovery strategies with analysis of implementation trade-offs.
- **Project Lily – New Architecture and Technology Stack for Every Voice Engaged Company** Jan. 2022 – May 2022
  - Improved moderators' experience for an online deliberation platform regarding forum and participant management.
  - Developed back-end APIs using Spring Boot, integrated Twilio for messaging, and AWS for hosting/email services.
  - Designed PostgreSQL database schema and used pgAdmin to manage registration and participant data.
- **Campus Listing Platform** Jan. 2022 – May 2022
  - Designed an Android application for OSU faculty and students to trade items.
  - Built system architecture and core functions in Java, leveraging Firebase to store item data with GPS coordinates.
- **Peer Evaluation Tool** Nov. 2020 – Dec. 2020
  - Designed a web application enabling students to provide peer evaluations and instructors to manage grading.
  - Implemented in Ruby on Rails and JavaScript with MVC architecture; stored user roles and peer reviews in SQL.

Additional Information

- **Polyhedral Thinker Reading Club, OSU** Mar. 2020 – Jul. 2021
  - Served as Minister of Multimedia Publicity Department.
  - Offered tech support for multiple media platforms; handled publicity affairs including poster design, video clips, and WeChat account management.
  - Organized major student events and coordinated with CSSS to implement activities.