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- **Problem Statement ID -** SIH1750
- **Problem Statement Title -**
  Creating a Comprehensive Web Application Fuzzer
- **Theme -** Miscellaneous
- **PS Category -** Software
- **Team ID -** S178
- **Team Name -** Tekstatik

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FizzBuzz:

web fuzzing and resolution tools for developers

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Proposed Solution:

- Identifying, testing, and solving web application vulnerabilities has always been a problem leading to **security risks** and **delayed deployment**.
- Introducing **FizzBuzz**, a one stop integrated platform with all tools required to ease this process efficiently thus **evolving developer experience**.
- The solution offers the following-
  - ○ **Chrome extension** for detecting client-side requests to backend and fuzzing it to detect vulnerabilities and sending it to dashboard. Also highlights potential threats of malware injection.
  - ○ **CLI Tool** for deep server-side scans, logging vulnerabilities also having custom options for fuzzing.
  - ○ **IDE Fixer** for real-time code issue fixing for issues to be immediately addressed, reducing the risk of exploitation and pushing only quality code.
  - ○ **Web/App Dashboard** is the central hub for vulnerability data, analytics of issues and all the relevant solutions. Also contains risk assessment on basis of impact and status of applied fixes.

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TECHNICAL APPROACH

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Technology Stack:

Chrome Extension:

- React

CLI Tool:

- NodeJS

Web Dashboard:

- MERN

Scripts:

- Python
- JavaScript

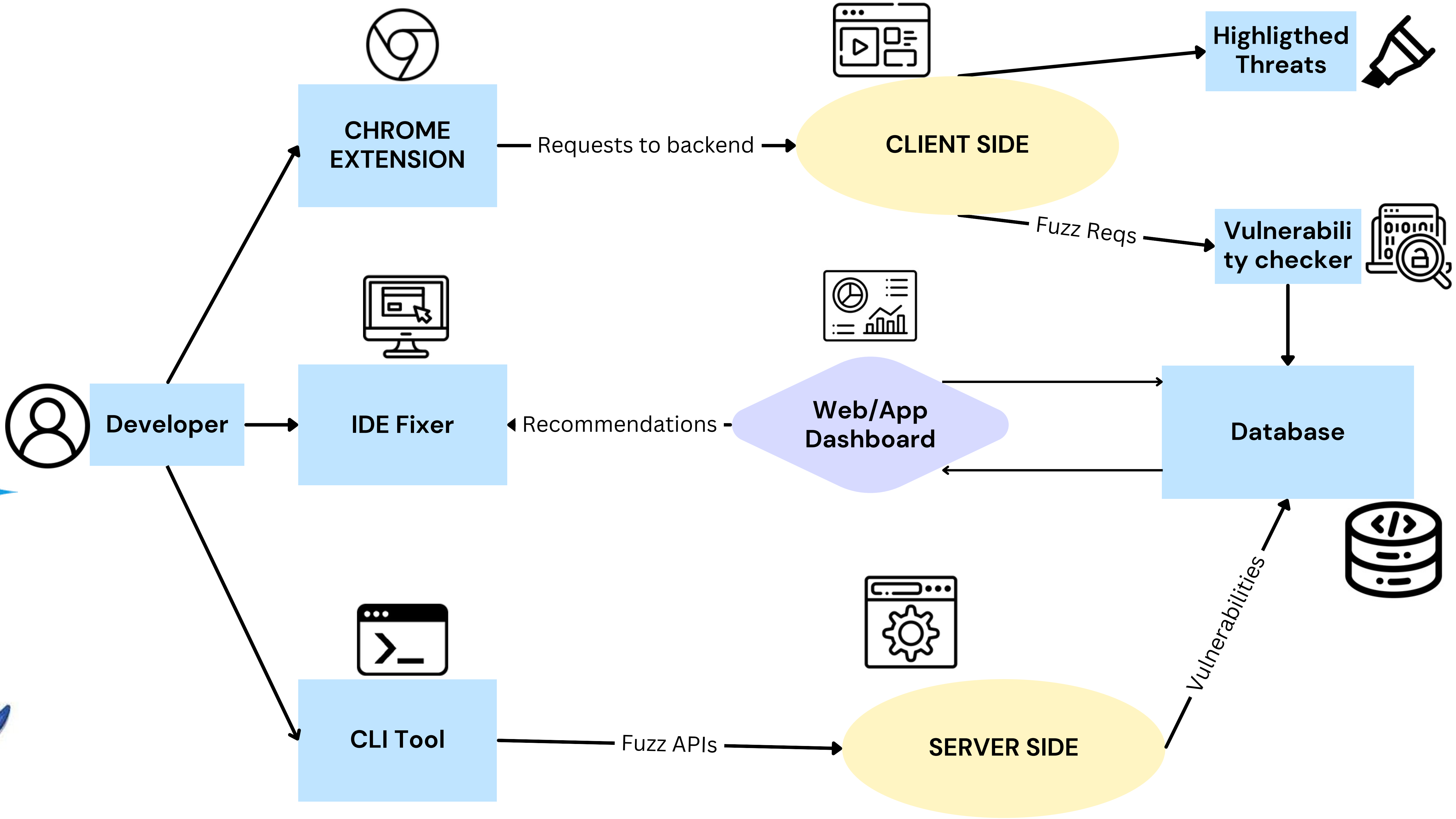
Database:

- MongoDB

Tools:

- Wfuzz
- Chrome DevTools
- Gemini API

Application Architecture:



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FEASIBILITY AND VIABILITY

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Feasibility Analysis

- Efficient integration
- Fuzz result processing
- Non competitive market landscape
- Increasing market demand
- Usage of established tools under the hood
- Reduced development costs and time
- Robust architecture

Potential Challenges

- Performance issues while complex system analysis
- Usage adoption
- Maintenance and upgradation according to market needs
- Different code writing process by different developers

Viable Strategies

- Modular Approach
- Demand for security
- One stop functionality
- Developer friendly
- Optimized fuzzing algorithms
- Fully customizable testcases and payload

IMPACT AND BENEFITS

Impact:

- Application uptime increased
- Low server load
- Improved developer efficiency
- Low production code break
- Foolproof code with good quality
- Secure code practicies

Benefits:

Social:

- Enhanced digital safety
- Production level knowledge

Economic:

- Cost savings
- Increased productivity

Environmental:

- Reduced resource consumption
- Efficient use of computing power

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RESEARCH AND REFERENCES

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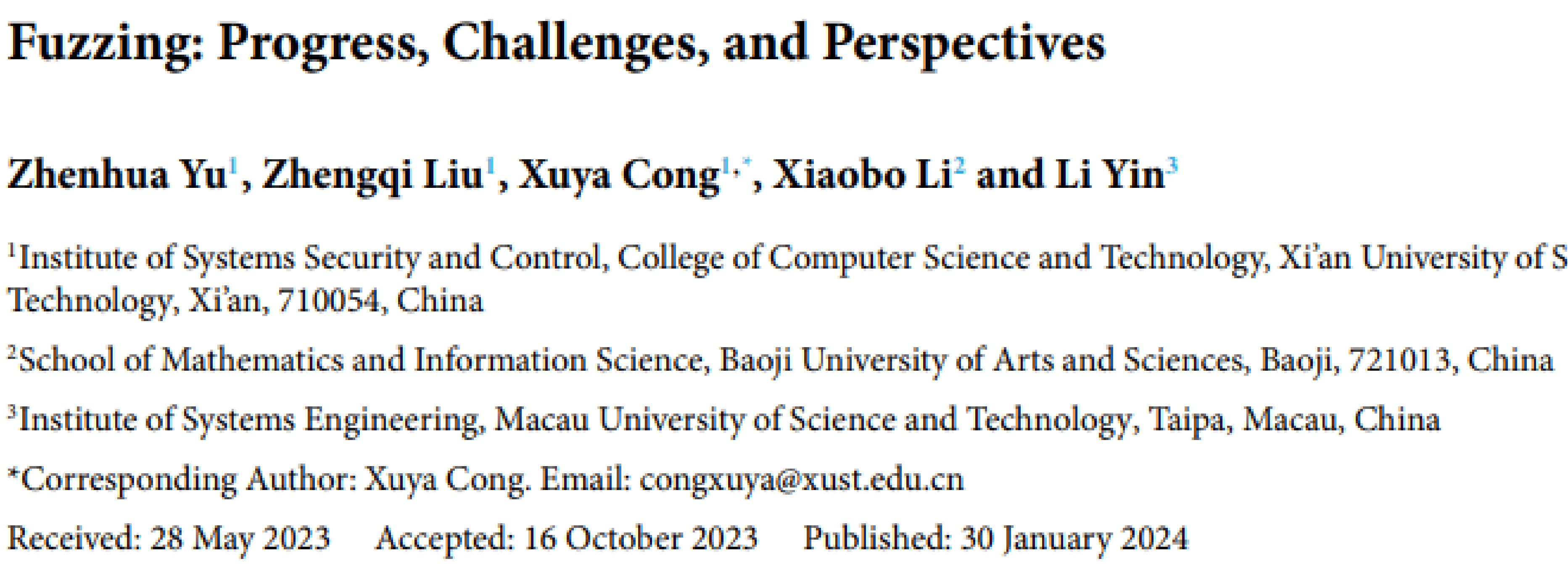
Resources followed:

- https://owasp.org/www-community/Fuzzing
- https://www.csoonline.com/article/568135/9-top-fuzzing-tools-finding-the-weirdest-application-errors.html
- https://www.freecodecamp.org/news/building-chrome-extension/
- https://medium.com/@techmindxperts/a-comprehensive-guide-to-ffuf-for-web-security-testing-207633f98217
- https://www.researchgate.net/publication/375873956_Fuzzing_Progress_Challenges_and_Perspectives

External tools used:

- https://wfuzz.readthedocs.io/en/latest/
- https://github.com/ffuf/ffuf
- https://developer.chrome.com/docs/extensions/reference/api/declarativeNetRequest

Research Paper:



Fuzzing: Progress, Challenges, and Perspectives

Zhenhua Yu[1], Zhengqi Liu[1], Xuya Cong[1,*], Xiaobo Li[2] and Li Yin[3]

[1]Institute of Systems Security and Control, College of Computer Science and Technology, Xi'an University of S
Technology, Xi'an, 710054, China

[2]School of Mathematics and Information Science, Baoji University of Arts and Sciences, Baoji, 721013, China

[3]Institute of Systems Engineering, Macau University of Science and Technology, Taipa, Macau, China

*Corresponding Author: Xuya Cong. Email: congxuya@xust.edu.cn

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