Umar Farooq

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Research Interests

My primary research lies in the area of programming languages and software engineering, with a focus on analyzing and solving practical issues in the development of mobile applications. In addition, I have developed systems that exploit the synergy between software engineering and emerging techniques (in LLMs and Generative AI) to address issues in both research areas.

Professional Experience

- **Louisiana State University (LSU)** — Baton Rouge, LA
  Assistant Professor (Tenure-Track) – Computer Science & Engineering — *Aug. 2023 - Current*

- **ByteDance/TikTok Inc.** — Mountain View, CA
  Software Engineer – Compiler Infrastructure — *Nov. 2021 - Jul. 2023*

- **University of California, Riverside (UCR)** — Riverside, CA
  Graduate Researcher — *Sept. 2016 - Oct. 2021*

Education

- **University of California, Riverside (UCR)** — Riverside, CA
  Ph.D. in Computer Science & Engineering — *Fall 2016 – Fall 2021*

  Dissertation: Runtime, Analysis, and Tools for Reliable Management of Mobile App States.

  Committee: Zhijia Zhao (advisor), Rajiv Gupta, Nael Abu-Ghazaleh, Manu Sridharan, and Zhiyun Qian.

Awards & Honors

- **ACM SIGMOBILE Research Highlights**: Awarded in 2018 for MobiSys'18 paper.
- **Best Paper Runner-up Award**: At MobiSys'18 for RuntimeDroid paper.
- **Dean's Fellowship Award**: At the University of California Riverside for 2017-2018.
- **University Merit Scholarship**: Awarded to top-3 ranked students for 2010-12 academic years at Virtual University.

Funding/Grants

- **A Unified Framework for Static Analysis of Multi-Language Mobile Apps** — *$ 180,000*
  Louisiana Board of Regents – Research Competitiveness Subprogram (3 Years)

- **Memory Forensics-Guided Execution Reconstruction for Android Devices (Co-PI)** — *$ 492,922*
  Department of Homeland Security – Criminal Investigations and Network Analysis

Selected Publications

https://csc.lsu.edu/~ufarooq/publications

SIGIR '23 **MobileRec: A Large-Scale Dataset for Mobile Apps Recommendation.**
M.H. Maqbool, Umar Farooq, Adib Mosharrof, A.B. Siddique, and Hassan Foroosh, "MobileRec: A Large-Scale Dataset for Mobile Apps Recommendation," In Proceedings of the 46th ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR'23), 10 pages, *To Appear*. **[Full Paper, Resource Track]**

AST '23 **Detecting Potential User-data Save & Export Losses due to Android App Termination.**
Sydur Rahaman, Umar Farooq, Iulian Neamtiu and Zhijia Zhao, "Detecting Potential User-data Save & Export Losses due to Android App Termination," In Proceedings of the 4th ACM/IEEE International Conference on Automation of Software Test (AST 2023), 11 pages, *To Appear*. **[Full Paper, Research Track]**

CC '23	**Linker Code Size Optimization for Native Mobile Applications.** Gai Liu, <u>Umar Farooq</u>, Chengyan Zhao, Xia Liu and Nian Sun, "Linker Code Size Optimization for Native Mobile Applications," In Proceedings of the 32nd ACM SIGPLAN International Conference on Compiler Construction, 2023 (CC'23), pp. 168–179, DOI: https://doi.org/10.1145/3578360.3580256. **[Full Paper, Research Track]**
BIGDATA '22	**Proactive Prioritization of App Issues via Contrastive Learning.** Moghis Fereidouni, Adib Mosharrof, <u>Umar Farooq</u> and A.B. Siddique, "Proactive Prioritization of App Issues via Contrastive Learning," In Proceedings of the 2022 IEEE International Conference on Big Data (Big Data), 2022, pp. 535-544, DOI: https://doi.org/10.1109/BigData55660.2022.10020586. **[Full Paper, Research Track, Acceptance Rate: 19.2%]** ⍉
BIGDATA '20	**App-Aware Response Synthesis for User Reviews.** <u>Umar Farooq</u>, A.B. Siddique, Fuad Jamour, Zahijia Zhao and Vagelis Hristidis, "App-Aware Response Synthesis for User Reviews," 2020 IEEE International Conference on Big Data (Big Data), 2020, pp. 699-708, DOI: https://doi.org/10.1109/BigData50022.2020.9377983. **[Full Paper, Research Track, Acceptance Rate: 15.5%]** ⍉
OOPSLA '20	**LiveDroid: Identifying and Preserving Mobile App State in Volatile Runtime Environments.** <u>Umar Farooq</u>, Zhijia Zhao, Manu Sridharan and Iulian Neamtiu, "LiveDroid: Identifying and Preserving Mobile App State in Volatile Runtime Environments," 2020 Proc. ACM Program. Lang. 4, OOPSLA, Article 160 (November 2020), 30 pages, DOI: https://doi.org/10.1145/3428228. **[Full Paper, Research Track]** ⍉
GETMOBILE	**RuntimeDroid: Restarting-Free Runtime Change Handling for Android Apps.** <u>Umar Farooq</u> and Zhijia Zhao, "RuntimeDroid: Restarting-Free Runtime Change Handling for Android Apps," 2019 GetMobile: Mobile Computing and Communications 22, 4, 25–29, DOI: https://doi.org/10.1145/3325867.3325879. **[Invited short article]**
ASPLOS '19	**Scalable Processing of Contemporary Semi-Structured Data on Commodity Parallel Processors – A Compilation-based Approach.** Lin Jiang, Xiaofan Sun, <u>Umar Farooq</u> and Zhijia Zhao, "Scalable Processing of Contemporary Semi-Structured Data on Commodity Parallel Processors – A Compilation-based Approach," 2019 In Proceedings of the Twenty-Fourth International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS '19). Association for Computing Machinery, New York, NY, USA, 79–92, DOI: https://doi.org/10.1145/3297858.3304008. **[Full Paper, Research Track, Acceptance Rate: 21.1%]** ⍉
MOBISYS '18 🎖	**RuntimeDroid: Restarting-Free Runtime Change Handling for Android Apps.** <u>Umar Farooq</u> and Zhijia Zhao, "RuntimeDroid: Restarting-Free Runtime Change Handling for Android Apps," 2018 In Proceedings of the 16th Annual International Conference on Mobile Systems, Applications, and Services (MobiSys '18). Association for Computing Machinery, New York, NY, USA, 110–122, DOI: https://doi.org/10.1145/3210240.3210327. **[Full Paper, Research Track]** [*Best Paper Runner-up Award, and ACM SIGMOBILE Research Highlights*] ⍉

TEACHING EXPERIENCE

- **CSC 7135 – Software Engineering**   LSU
  Instructor   *Spring '24*
  - Graduate course emphasizing the engineering of large-scale software systems.

- **CSC 4101 – Programming Languages**   LSU
  Instructor   *Fall '23, '24*
  - Undergraduate senior-level course on design concepts of programming languages

DEPARTMENTAL SERVICE

- **Faculty Search Committee on Software Engineering** 2023-24.

- **PhD Admission Committee** 2023-24.

- **Undergraduate Course Curriculum Committee** 2023-24.

THESIS AND DISSERTATION COMMITTEES

- **Mo Zhou** – Dean's Representative (2024)

Professional Service

- **Co-Chair Publicity,** The ACM SIGPLAN International Conference on Systems, Programming, Languages and Applications: Software for Humanity (SPLASH'25).

- **Co-Chair Web,** The ACM SIGPLAN International Conference on Systems, Programming, Languages and Applications: Software for Humanity (SPLASH'25).

- **Program Committee,** The 5th International Conference on Code Quality (ICCQ'25).

- **Reviewer,** The 33rd ACM International Conference on Information and Knowledge Management (CIKM'24).

- **Co-Chair Publicity,** The ACM SIGPLAN International Conference on Systems, Programming, Languages and Applications: Software for Humanity (SPLASH'24).

- **Co-Chair Web,** The ACM SIGPLAN International Conference on Systems, Programming, Languages and Applications: Software for Humanity (SPLASH'24).

- **Artifact Evaluation Committee,** The European Conference on Computer Systems (EuroSys'22).

- **Artifact Evaluation Committee,** ACM Symposium on Operating Systems Principles (SOSP'21).

- **External Reviewer,** ACM/IEEE International Symposium on Code Generation and Optimization (CGO'21).

- **Program Committee,** ACM Student Research Competition at SPLASH 2021.

- **Artifact Evaluation Committee,** USENIX Symposium on Operating Systems Design and Implementation (OSDI'21).

- **Program Committee,** International Conference on Code Quality (ICCQ'21).

- **Artifact Evaluation Committee,** International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS'21).

- **Artifact Evaluation Committee,** ACM International Conference on Compiler Construction (CC'21).

Outreach

- **High School Summer Research Program (HSSR)** at serving as a Mentor for LSU's outreach program.

- **K-12 Computer Science AP Course Development** at Moreno Valley Unified School District (MVUSD).

- **Mobile App Development Training for K-12 Teachers** at Moreno Valley Unified School District (MVUSD).

References

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