Vahid **Alizadeh**

Assistant Professor · School of Computing · DePaul University

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Current Position & Past Educations

DePaul University — *Chicago, USA*

Assistant Professor, College of Computing & Digital Media — *2020 - now*

- Main Research Direction: **"Software Intelligence and Analysis"**

University of Michigan — *Dearborn, USA*

Ph.D, Computer & Information Science — *2015 - 2020*

- Thesis Title: **"A User-aware Intelligent Refactoring for Discrete and Continuous Software Integration"**

University of Tehran — *Tehran, Iran*

M.Sc, Electrical Engineering, Major in Control Systems — *2011-2014*

- Thesis Title: "**Face Recognition Using Thermal Image Processing.**"

Iran University of Science and Technology — *Tehran, Iran*

B.Sc, Electrical Engineering, Major in Control Systems — *2006-2011*

- Thesis Title: "**Implementation and Designing Intelligent Traffic Light Control by Fuzzy Logic.**"

RESEARCH

Research Interests

- Software Refactoring
- Software Analysis
- Software Maintenance & Evolution
- Software documentation
- Intelligent Software Engineering
- Empirical Software Engineering
- Artificial Intelligence
- Mining Software Repositories

Patents & Inventions

[PA1] **Vahid Alizadeh**, Marouane Kessentini, Mohamed Wiem MKaouer, "Interactive And Dynamic Search Based Approach To Software Refactoring Recommendations," US Patent App. 16/386,551, 2019

[IN1] Marouane Kessentini, **Vahid Alizadeh**, "Interactive Refactoring Bot," Invention Number: UM1794. **This invention is licensed and deployed by industry partners.**

[IN2] Marouane Kessentini, Jeffrey Yackley, **Vahid Alizadeh**, "Architecture Defects Detection," Invention Number: UM1781

[IN3] Marouane Kessentini, Soumaya Rebai, **Vahid Alizadeh**, " Automated Refactoring Documentation and Code Reviews Bot," Invention Number: UM1763

Research Highlighted Projects

Software Refactoring SLR and Repository WebApp — *https://slr.v-alizadeh.info/*

Researcher, Developer, Maintainer — *2019 - PRESENT*

- Conducted a comprehensive and rigorous systematic literature review (SLR) of the field of software refactoring
- Developed the first-ever tool that systematically categorized and analyzed scientific literature related to software refactoring
- Created an innovative visualization and interactive presentation of the SLR results and data, which provides a clear and comprehensive overview of the literature in this field
- Made the tool publicly available for researchers in the software refactoring community to use for their own research
- Published a paper outlining the SLR methodology and tool, and presented the project at the International Workshop of Refactoring 2020

Intelligent Software Refactoring WebApp *http://refactor.v-alizadeh.info/*

Researcher, Developer, Maintainer *2018 - PRESENT*

- Developed and maintained the first interactive and intelligent refactoring recommendation tool
- Collaborated with industry partners to evaluate and incorporate their feedback in the tool's development
- Published multiple conference and journal articles showcasing the tool and its results, demonstrating its usefulness in software engineering research and practice
- Contributed to the development of patented and licensed inventions for the implemented approaches

Publications

› [5-year Impact Factor] › [Acceptance Rate] › [CORE Ranking] › [SJR Ranking]

All publications listed below are **peer-reviewed** academic works. The ranking and impact metrics displayed are sourced from internationally recognized databases: **Impact Factor** values are obtained from Web of Science Journal Citation Reports, **Acceptance Rates** are gathered from conference proceedings and organizer reports, **CORE Rankings** (A*, A, B, C) are from the Computing Research and Education Association of Australasia (*CORE portal*), and **SJR Rankings** (Q1-Q4 quartiles) are from the SCImago Journal & Country Rank database (*SJR portal*). These metrics provide standardized measures of publication quality, venue prestige, and research impact within the academic community. Underlined author names indicate student co-authors who worked under my supervision or mentorship.

Journal Articles

[J7] Kessentini, W., & **Alizadeh, V.** (2022). Semi-Automated Metamodel/Model Co-Evolution: A Multi-Level Interactive Approach. *Springer Journal of Software and Systems Modeling* [Published on 06 April 2022] [SoSyM2022] [2.1] [A] [Q2]

[J6] Abid, C., Gaaloul, K., Kessentini, M., & **Alizadeh, V.** (2021). What Refactoring Topics Do Developers Discuss? A Large Scale Empirical Study Using Stack Overflow. *IEEE Access*. [Published on 31 December 2021] [IEEE Access2021] [3.4] [–] [Q1]

[J5] Abid, C., **Alizadeh, V.**, Kessentini, M., Dhaouadi, M., & Kazman, R. (2021). Prioritizing refactorings for security-critical code. *Automated Software Engineering*, 28(2), 1-28. [Springer-ASE2021] [3.5] [B] [Q2]

[J4] Rebai, S., Kessentini, M., **Alizadeh, V.**, Sghaier, O. B., & Kazman, R. (2020). Recommending refactorings via commit message analysis. *Information and Software Technology*, 126, 106332. [Elsevier-IST2020] [4.9] [A] [Q1]

[J3] Rebai, S., **Alizadeh, V.**, Kessentini, M., Fehri, H., & Kazman, R. (2020). Enabling decision and objective space exploration for interactive multi-objective refactoring. *IEEE Transactions on Software Engineering*. [TSE2020] [8.9] [A*] [Q1]

[J2] Abid, C., Kessentini, M., **Alizadeh, V.**, Dhouadi, M., & Kazman, R. (2020). How does refactoring impact security when improving quality? a security-aware refactoring approach. *IEEE Transactions on Software Engineering*. [TSE2020] [8.9] [A*] [Q1]

[J1] **Alizadeh, V.**, Kessentini, M., Mkaouer, M. W., Ocinneide, M., Ouni, A., & Cai, Y. (2018). An interactive and dynamic search-based approach to software refactoring recommendations. *IEEE Transactions on Software Engineering*, 46(9), 932-961. [TSE2018] [7.6] [A*] [Q1]

Conference Papers

[C13] Biswasa, S., Ansari, S., **Alizadeh, V.**, & Rahman, A. (2025), "Real-time Anomaly Detection in Community Pharmacies Prescription Processing Using Machine Learning", [**Accepted** for 61st The Midwest Business Administration Association (MBAA) International and the Business & Health Administration Association (BHAA)]

[C12] Kessentini, W., & **Alizadeh, V.** (2020, October). Interactive metamodel/model co-evolution using unsupervised learning and multi-objective search. In *Proceedings of the 23rd ACM/IEEE International Conference on Model Driven Engineering Languages and Systems* (pp. 68-78). [MoDELS2020 - Best Paper Award] [2.9] [20.4%] [A]

[C11] Abid, C., **Alizadeh, V.**, Kessentini, M., Ferreira, T. D. N., & Dig, D. (2020). 30 years of software refactoring research: A systematic literature review. *arXiv preprint* arXiv:2007.02194. [arXiv]

[C10] Kessentini, W., & **Alizadeh, V.** (2020, October). Transforming Interactive Multi-objective Metamodel/Model Co-evolution into Mono-objective Search via Designer's Preferences Extraction. In *International Symposium on Search Based Software Engineering* (pp. 88-104). Springer, Cham.[SSBSE2020] [1.8] [28.4%] [B]

[C9] **Alizadeh, V.**, Ouali, M. A., Kessentini, M., & Chater, M. (2019, November). RefBot: Intelligent software refactoring bot. In *2019 34th IEEE/ACM International Conference on Automated Software Engineering* (pp. 823-834). IEEE. [ASE2019] [5.9] [20.3%] [A*]

[C8] **Alizadeh, V.**, Fehri, H., & Kessentini, M. (2019, September). Less is More: From Multi-objective to Mono-objective Refactoring via Developer's Knowledge Extraction. In *2019 19th International Working Conference on Source Code Analysis and Manipulation* (pp. 181-192). IEEE. [SCAM2019] [2.3] [20.6%] [C]

[C7] Rebai, S., Sghaier, O. B., **Alizadeh, V.**, Kessentini, M., & Chater, M. (2019, September). Interactive refactoring documentation bot. In *2019 19th International Working Conference on Source Code Analysis and Manipulation* (pp. 152-162). IEEE. [SCAM2019] [2.3] [20.6%] [C]

[C6] Yackley, J. J., Kessentini, M., Bavota, G., **Alizadeh, V.**, & Maxim, B. R. (2019, September). Simultaneous Refactoring and Regression Testing. In *2019 19th International Working Conference on Source Code Analysis and Manipulation* (pp. 216-227). IEEE. [SCAM2019] [2.3] [20.6%] [C]

[C5] **Alizadeh, V.**, Kessentini, M., Mkaouer, W., Ocinneide, M., Ouni, A., & Cai, Y. (2018, May). Interactive and dynamic multi-objective software refactoring recommendations. In *2018 33rd IEEE/ACM International Conference on Automated Software Engineering* (pp. 1-30). [ASE2018] [5.9] [16.6%] [A*]

[C4] **Alizadeh, V.**, & Kessentini, M. (2018, September). Reducing interactive refactoring effort via clustering-based multi-objective search. In *2018 33rd IEEE/ACM International Conference on Automated Software Engineering* (pp. 464-474). IEEE. [ASE2018] [5.9] [16.6%] [A*]

[C3] **Alizadeh, V.** (2017). Gait pattern recognition using accelerometers. *arXiv preprint* arXiv:1703.03921. [arXiv]

[C2] **Alizadeh, V.**, & Dehzangi, O. (2016, November). The impact of secondary tasks on drivers during naturalistic driving: Analysis of EEG dynamics. In *2016 IEEE 19th International Conference on Intelligent Transportation Systems* (pp. 2493-2499). IEEE. [ITSC2016] [5.5] [21%] [–]

[C1] **Alizadeh, V.**, RayatDoost, S., & Arbabi, E. (2014, May). Effect of different partitioning strategies of face imprint on thermal face recognition. In *2014 22nd Iranian Conference on Electrical Engineering* (ICEE) (pp. 1108-1112). IEEE. [ICEE2014] [1.7] [–]

Book Chapters

[B2] Parizad, A., Baghaee, H. R., **Alizadeh, V.**, & Rahman, S. (2025). Emerging Technologies and Future Trends in Cyber-Physical Power Systems: Toward a New Era of Innovations. in *Smart Cyber-Physical Power Systems: Solutions from Emerging Technologies*, 2, 525-565. Publisher: Wiley-IEEE Press.

[B1] **Alizadeh, V.**, Kessentini, M., & Maxim, B. R. (2019). Refactoring Support for Variability-intensive Systems. In *Software Engineering for Variability Intensive Systems* (pp. 275-294). Publisher: Auerbach Publications.

Posters & Presentations

[P5] **Vahid Alizadeh**, Marouane Kessentini, ”Interactive and Intelligent Software Refactoring Bot”, *AI For Society Symposium, Ann Arbor, Michigan*, 2019.

[P4] **Vahid Alizadeh**, Houcem Fehri, Marouane Kessentini, ”Software Developers Knowledge Extraction from Multi-Objective Search ”, *10th International Conference on Evolutionary Multi-Criterion Optimization*, 2019.

[P3] **Vahid Alizadeh**, Marouane Kessentini, ”Interactive clustering-based multi/many-objective search for Software Refactoring: Industrial Case Studies”, *10th International Conference on Evolutionary Multi-Criterion Optimization*, 2019.

[P3] **Vahid Alizadeh**, O. Dehzangi, ”The Impact of Secondary Tasks on Drivers During Naturalistic Driving: Analysis of EEG Dynamics”, *2nd Annual UMTRI Transportation Safety Research Symposium*, 2016.

[P2] **Vahid Alizadeh**, C. Williams, O. Dehzangi, ”Wearable Inertial Sensor-based Driver Authentication using Gait Analysis”, *2nd Annual UMTRI Transportation Safety Research Symposium*, 2016.

[P1] M. Taherisadr, **V. Alizadeh**, O. Dehzangi, ”New Approach to Detection of Driver Facial Artifacts in EEG Signals Using Joint Spectral and Geometric Features”, *2nd Annual UMTRI Transportation Safety Research Symposium*, 2016.

Grants & Awards

Internal

URC: Summer Research Grant

Up tp $7,500

Purpose: Support for creative projects that engage students as research assistants

Funded *- 2024*

- **Title**: Real-time Anomaly Detection in Community Pharmacies Prescription Processing Using Deep Learning
- **Agency**: DePaul
- **Duration**: 2024 Summer
- Collaboration with a faculty from DePaul’s Business School

Faculty Summer Research Program

$10,000

Purpose: Enhance the research environment and creative activities at CDM

Funded *- 2023*

- **Title**: Towards Customized and Contextual Code Refactoring
- **Agency**: CDM - DePaul
- **Duration**: 2023 Summer

Graduate Research Assistant Program

1 Full time Grad Student

Purpose: Research project or creative activity related to students’ academic studies

Funded *- 2022*

- **Title**: Software Refactoring and Code Quality Repository
- **Agency**: CDM - DePaul
- **Duration**: 2022 Winter/Spring Quarter

External

DePaul – RFUMS Grant Program: AI in Biomedical Discovery & Healthcare

up to $67,000

Purpose: Inter-institutional collaborative research projects between DePaul and RFUMS

*Submitted Oct 2024 - **Funded** Dec 2024*

- **Title**: Optimizing Community Pharmacy Workflow through Artificial Intelligence: Reducing Workload and Boosting Productivity
- **Agency**: DePaul – RFUMS
- **Duration**: One year - 2025
- Collaboration with one faculty from DePaul's Business School and one faculty from Rosalind Franklin University of Medicine and Science (RFUMS)

CISE Community Research Infrastructure (CCRI)

$205,761

Purpose: Discovery and Learning in The Core CISE Disciplines

*Submitted Jan 2022 - **Funded** Sep 2022*

- **Title**: A Software Refactoring Community Infrastructure
- **Agency**: NSF
- **Duration**: Three year
- **Role**: Co-PI
- **Award #**: *2213766*
- **$1.3M** total - collaboration between **6** universities [2409729, 2213767, 2213764, 2213765, 2213763]

MTRAC-Advanced in Computing Program

$75, 000

Purpose: Research, Travel, and Publications

***Funded** - 2019*

- **Title**: Software Refactoring Technology for Continuous Control of Quality and Security
- **Agency**: State of Michigan
- **Duration**: One year
- **Role**: Co-PI

TEACHING

Teaching Highlighted Projects

DePaul Course Website

https://depaul.v-alizadeh.info/

Developer, Maintainer — *2021 - PRESENT*

- Developed a comprehensive website for DePaul University courses, providing students with a centralized platform for accessing course materials, resources, coding examples, and readings.
- Developed the ***DePulse*** tool, an interactive feature that allows students to map out their future academic course requirements, plan prerequisites effectively, and visualize their path towards achieving their educational goals, providing a comprehensive overview of program requirements and course dependencies.
- Implemented features like course registration using a unique passphrase, DePulse tool for academic planning and course mapping, and detailed course descriptions and schedules.
- Designed and structured the website to enhance the learning experience, making it easier for students to explore and utilize the curated content effectively.

Teaching Experiences

DePaul University

Chicago, IL, USA

Graduate Courses: — *2020-Present*

- **SE 489** Machine Learning Engineering for Production (MLOps) – New course design and instruction.
  - Focused on the end-to-end lifecycle of machine learning systems.
  - Covered MLOps principles, CI/CD for ML, model deployment, and monitoring.
  - Hands-on projects using tools like Docker, Kubernetes, and cloud platforms to simulate a real-world MLOps end-to-end pipeline.
  - Emphasized operationalization of ML models at scale.
  - Included practical exercises on model/data versioning, testing, and deployment strategies.
- **SE 480** Software Architecture I – Complete course redesign and instruction.
  - Emphasized foundational architectural patterns and design principles.
  - Covered quality attributes (e.g., performance, scalability, security).
  - Included API design, microservices, and architectural documentation.
- **SE 450** Object-Oriented Software Development – Instruction focused on:
  - Core object-oriented principles and design patterns.
  - UML modeling for software design.
  - Best practices in developing robust and maintainable software systems.
  - Hands-on projects using Java and design patterns.
- **SE 475** Managing Globally Distributed Software Development – Curriculum covered:
  - Strategies for effective communication and collaboration in global teams.
  - Hands-on projects simulating distributed software development environments using GitHub and GitHub Actions.
  - Project management techniques for distributed software development.
  - Addressing cultural challenges in global software engineering projects.
- **CSC 695** Master's Research

Undergraduate Courses:

- **SE 371** Practices of Global Software Development
- **SE 350** Object-Oriented Software Development

University of Michigan

Dearborn, MI, USA

2015-2020

- Software Engineering I, II - [TA]
- Discrete Structures I, II - [TA]
- Computer Organization & Assembly Language - [TA]
- Discrete Math - [TA]
- Data Structures & Algorithm Analysis - [TA]
- Algorithm Design & Analysis - [TA]
- Big Data - [TA]
- Advanced Data Mining - [TA]
- Expert Systems - [TA]
- Big Data Lab Sessions - [Instructor]
- Advanced Data Mining Lab - [Instructor]

University of Tehran

Tehran, Iran

2012-2013

- System Identification - [TA]
- Pattern Recognition - [TA]

Iran University of Science and Technology *Tehran, Iran*

2007

- MATLAB Programming and GUI Workshop
  1^{st} academic summer festival of IEEE student branch

SERVICE

Internal Services

University

2021 - Now **CDM faculty representative** on Academic Integrity Board (AIB)

College of Computing and Digital Media (CDM)

2024 - 2025 **Co-chair** of Financial Awards Committee (FAC)
2020 - Now **Member** of Financial Awards Committee (FAC)

School of Computing (SoC)

2021 - Now **Co-chair** of Software Engineering Program Committee (PC-SE)
2020 - Now **Member** of Computer Science Program Committee (PC-CS)
2024 - Now **Member** of Artificial Intelligence Program Committee (PC-AI)
2024 - Now **Member** Research Environment and Scholarship Committee (RESC)
2020 - Now **Member** of PhD Committee
2021 - Now **Member** of SoC Curriculum Committee
2024-2025 **Chair** of SoC Faculty Search and Recruitment Committees
2025 **Designer and Reviewer** of SE PhD Qualifying Breadth Exam
2024 **Committee Member** for MSc thesis defense (Advisor: Dr. N. Tomuro)
2023-2024 **Member** of SoC Faculty Recruitment Committee
2022-2023 **Member** of SoC Faculty Search Committee
2021-2024 Software Engineering MS Program Assessment
2023 **Committee Member** for MSc thesis defense (Advisor: Dr. W. Kessentini)
2021 **Member** of SE PhD Qualifying Breadth Exam (Designer and Reviewer)
2020 - 2021 **Member** of Software Engineering Program Committee (PC-SE)
2021 - 2022 **Member** of SoC Computing Resources Committee

External Services

2025 **Organizing and Program Committee Member** of the ACM/IEEE 28th International Conference on Model-Driven Engineering Languages and Systems (*MODELS25 Committee*)
2024 **PC Member** of 39th IEEE/ACM International Conference on Automated Software Engineering (*ASE24 Committee*)
2024 **PC Member** of 4th IEEE Conference on Code Quality (*ICCQ24 Committee*)
2024 **PC Member** of 21st International Conference on Mining Software Repositories (*MSR24 Committee*)
2023 **Manuscript Reviewer** of Springer Artificial Intelligence Review Journal
2023 **Manuscript Reviewer** of ACM International Conference on Computer Science and Application Engineering (CSAE2023)
2023 **Manuscript Reviewer** of Journal of Software Engineering Research and Development (JSERD)
2022 - 2023 **Executive Committee Member** of IEEE Chicago Section (*ieeechicago.org*)
2022 **Session Chair** of a technical research track in The 37th IEEE/ACM International Conference on Automated Software Engineering (*ASE22 Sessions*)
2022 **PC Member** of 6th IEEE/ACM International Workshop on Refactoring, co-located with ASE 2022 (*IWOR6 Committee*)
2022 **Organizing Committee Member** of The 37th IEEE/ACM International Conference on Automated Software Engineering (*ASE22 Organizing Committee*)
2022, 2024 **Committee Member** of The International Conference on Advances and Trends in Software Engineering (SOFTENG)
2022 **Manuscript Reviewer** of Empirical Software Engineering Journal
2021 **PC Member** of 5th IEEE/ACM International Workshop on Refactoring, co-located with ASE 2021 (*IWOR Committee*)

2021 **PC Member** of 27th IEEE International Conference on Software Analysis, Evolution and Reengineering (*SANER Committee*)
2020 **Manuscript Reviewer** of IEEE Transactions in Software Engineering (TSE)
2020 **External Manuscript Reviewer** of 42nd International Conference on Software Engineering (ICSE)
2019 **External Manuscript Reviewer** of 34rd IEEE/ACM International Conference on Automated Software Engineering (ASE)
2018 **External Manuscript Reviewer** of 33rd IEEE/ACM International Conference on Automated Software Engineering (ASE)
2016 **Manuscript Reviewer** of 19th IEEE International Conference on Intelligent Transportation Systems (ITSC)
2008 - Now **Member** of Institute of Electrical and Electronics Engineers (IEEE)
2008-10 **Chairman** of IEEE Student Branch of IUST.
2008-11 **President** of Scientific Association of Electrical Engineering Department of IUST.
2008-11 **Deputy** of National Scientific Student's Organization of Electrical Engineering in IUST.
2007-10 **Member** of Editorial Board of IEEE Student Branch Newsletter of IUST.
2007-10 **Designer and Administrator** of IEEE Student Branch Website of IUST.
2009 **Executive Cooperator** in 17th Iranian Conference on Electrical Engineering.

Honors, Awards, & Certificates

2025 **Excellence in Teaching Awards** DePaul University
2022 **Teaching and Learning Foundation Certificate** DePaul University-Center for Teaching and Learning
2020 **ACM SIGSOFT Distinguished Paper Awards** MODELS Conference
2020 **Distinguished University of Michigan-Dearborn Honors Scholar** U of M Dearborn
2019 **Distinguished Graduate Student Research Award** College of Engineering and Computer Science - U of M Dearborn
2019 **2018 UM Invention of the year** Refactoring bot technology, selected among over 500 inventions of the three UM campuses
2011 **Top 0.5% among over 30,000** participants in the nationwide university entrance exam for M.Sc degree in Electrical Eng.
2005 **Top 0.1% among over 400,000** participants in the nationwide university entrance exam for B.Sc degree in Math and Physics.
2011-13 **Awarded full scholarship** in MSc. Degree from UT.
2006-11 **Awarded full scholarship** in BSc. Degree from IUST.
2013 **Certified with Distinction** for Image and Video Processing course by Duke University.
2010 **Certified for AVR Microcontroller** Practical Course with A+ Grade Offered by IEC Institution
2009 **Certified for PLC S7-300** Practical Course Offered by IEC Institution

Professional Experiences

Internships

San Jose, CA, USA

eBay *Jun. 2019-Sep. 2019*

- Developer Ecosystem
  Monitoring software quality and CI/CD pipeline
  Investigating eBay pre/post release code quality

San Jose, CA, USA

eBay *Jun. 2018-Sep. 2018*

- Developer Ecosystem
  Software quality analysis and Refactoring recommendation
  Investigating eBay legacy code quality

Tehran, Iran

Shiva Systems Pooya Co. *Jun. 2011-Sep. 2011*

- Research and Development
  Conducted research and development in sensors and instrumentations
  Designed, developed, and tested prototype hardware and software

Research Assistant

Dearborn, MI, USA

University of Michigan - Dearborn *2016-2020*

- Intelligent Software Engineering Lab *(website)*
  Research: Improving Refactoring Recommendations Using Machine Learning Techniques.

Dearborn, MI, USA

University of Michigan - Dearborn *2015-2016*

- Wearable systems & Signal Processing Lab *(website)*
  Research: Multi-modal Driver State Monitoring and Intervention.

Tehran, Iran

University of Tehran *2011-2014*

- Image Processing & Computer Vision Lab
  Discovered a new method using graph features allowing for better classification of thermal images of faces.
  Collaborated with Research Center of Intelligent Signal Processing to collect data for the thesis study.