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Anna Eilertsen

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CORE SKILLS

- **Java and Kotlin** (Maven, Gradle, JUnit, PowerMock, EasyMock, MockK, Guice)
- **Refactoring** (maintainability, correctness, repository mining, tool design, usability)
- **IDE Plugin Development** (developed for Eclipse, IntelliJ, Visual Studio Code)
- Human-centric design of **software engineering tools** (user studies, DevEx)
- **Outreach**, supervision, mentoring, committee work, reports, documentation, communication

EDUCATION

University of Bergen, **Ph.D. in Computer Science** Oct. 2016 - Dec 2021
Thesis title: *Improving the Usability of Refactoring Tools for Software Change Tasks*
Partially conducted at University of British Columbia, hosted by Dr. Gail Murphy, 2018-2019

University of Bergen, **M.S. in Software Engineering** (3.8 GPA, thesis grade A) Aug. 2014 - Jun. 2016
Thesis title: *Making Software Refactorings Safer*
Joint degree with University College of Western Norway

University of Bergen, **B.S. in Computer Science** (3.4 Major / 3.3 Overall GPA) Aug. 2011 - Jun. 2014

EMPLOYMENT

Amazon May 2022 - Ongoing
Software Development Engineer 2, Subscriptions team

- Owning team for several Tier-1 services that handle Amazon subscriptions worldwide including Prime, Prime Video, Audible, IMDB, Kindle, Amazon Music, RxPass, Subscribe & Save, etc.
- Experience with the full software development life cycle: design, implementation, code reviews, source control management, build processes, testing, and operations experience
- Tech stack includes Java and Kotlin microservices, Graphql and RPC APIs, PowerMock, EasyMock, JUnit, Guice dependency injection framework, IAM roles and other authentication solutions, Cloudwatch and Jarvis, git
- Notable projects:
    - Design and implementation of new resource-oriented APIs for managing a new product
        - Initial design and review, communicating with stakeholders, resolving ambiguity
        - Implementing Kotlin microservice backend
        - Setting up IAM roles and helping clients integrate
    - Latency optimization of Tier-1 service APIs
    - Peak event readiness PoC for 2023 Q2 Prime day for the team's Tier-1 services:
        - Make traffic projections, plan scaling, and descaling
        - perform service operational readiness auditing
        - perform load testing, and chaos testing, coordinate code freeze with stakeholders

Norwegian Agency for Quality Assurance in Education May 2021 - Nov 2021
Subject expert for Informatics for Ph.D. Program Accreditation Committee

- Evaluated application for approval of a Ph.D. program in information technology
- Moderated dialogue between the committee and the educational institution
- Collaborated to reach final consensus and recommendations and write final reports

University of Bergen
PhD Research Fellow 2016 - 2021
Duties included developing software-based research tools, planning research projects, conducting user studies, writing scientific papers, lecturing, developing course material, and mentoring.
Example Research Project | **Refactoring tool Usability**

- Technologies: Java, Python, Gradle, Google Sheets Scripting, LaTeX, git, Dataverse, Typescript, GitHub repository mining with RefactoringMiner and Java git API.
- Developed a proof-of-concept stepwise (Java) refactoring tool as an IntelliJ plugin.
- Built a synthetic software system to study developers' approaches to software change tasks.
- Developed a custom transcription plugin (in Typescript) for Visual Studio Code.
  Part of this work was conducted as a Visiting Research Student at the SPL lab at the University of British Columbia, hosted by Dr. Gail Murphy.

*Example Research Projec*t | **API/Client Co-Evolution**

- Technologies: ASM bytecode analysis library, Jena and Graal, SPARQL, Maven
- Used semantic web technology to analyze API/Client co-evolution in Java programs.

Example Supervision | **Enhancing Error Messages for Novices in Computer Science Education**

- Guided M.S students' research and thesis on novices' experiences with Python error messages

Example Teaching Tasks | **Introduction to Object-Oriented Programming** (INF101) **|** 450 students

- Developed weekly Java exercises (up to 3000 LOC) and larger term projects (up to 11K LOC) that illustrated concepts like abstraction, data structures, Test-Driven Development
- Created programming solutions, course notes, lectures, and exam exercises.

Manage and mentor teams of up to 12 junior TAs in code reviews and student feedback.

KNOWIT Solutions Bergen
Software Developer Intern Jun. 2015 - Aug. 2015

- Technologies: C#, Xamarin, iOS, Agile development, Scrum
- Developed digital signature solution for secure signatures on loan applications on iPad.

OTHER PROJECTS

Master's project | **Refactoring tool Correctness** *2015-2016*

- Implemented an Eclipse plugin that extends Java refactorings with dynamic correctness checks.

Global Game Jam | **Clippy the Game** 2015

- Developed 3D game in Unity during Global Game Jam (48 hours).

Course project: Agent Technologies | **Labyrinth Game Solving Agent** 2014

- Developed AI for solving dungeon exploration games using rule-based agent programming.

Course project: Machine Learning and Advanced Algorithms | **Text Recognition** 2014

- Developed text recognition algorithms using artificial neural networks (ANN)

Course project: Language Translation | **A Prolog Type Checker for Featherweight Java** 2013

- Implemented a type checker for a lightweight version of Java using declarative rules in Prolog.

SERVICE

2021 Panelist on Women in STEM Panel by Simula Bergen and Echo, *Bergen, Norway*
2021 Automated Software Engineering (ASE), Program Committee - NIER Track, *Melbourne, Australia*
2020 Automated Software Engineering (ASE), Program Committee - NIER Track, *Melbourne, Australia*
2020 Booster Conference Committee, *Bergen, Norway*
2020 International Conference on Software Engineering (ICSE), External Reviewer, *Seoul, South Korea*
2018 Software Language Engineering (SLE), Artifact Evaluation Committee, *Boston, USA*
2017 SPLASH conference, Student Volunteer, *Vancouver, Canada*

2016 Seminar Series on Advanced Techniques & Tools for Software Evolution, Local Chair, *Ber., Norway*
2016 Generative Programming: Concepts & Experiences (GPCE), External Reviewer, *Amst., Netherlands*
2016 Software Language Engineering (SLE), External Reviewer, *Amsterdam, Netherlands*
2016 - 2017 Organizer Girl Geek Dinners Bergen, Career network for women in IT, *Bergen, Norway*
2014 Curriculum Committee, Institute for Informatics, *University of Bergen, Norway*

PUBLICATIONS

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1. **Stepwise Refactoring Tools** 2021
   by A. M. Eilertsen and G. C. Murphy, in International Conference on Software Maintenance and Evolution (ICMSE'21)
   Included the development of a proof-of-concept refactoring plugin for IntelliJ.
2. **A Study of Refactorings During Software Change Tasks** 2021
   by A. M. Eilertsen and G. C. Murphy, in Journal of Software: Evolution and Process, Sept. 2021
   Included mining github repositories for commits containing refactorings and developing an experimental system for use in the study. I also developed a custom plugin for VS Code to aid the manual transcription of 130K words.
3. **Replication Data for: A Study of Refactorings During Software Change Tasks** 2021
   by A. M. Eilertsen and G. C. Murphy, in DataverseNO, https://doi.org/10.18710/VTTNXM
   Contains the experimental system and other research artifacts.
4. **The Usability (or Not) of Refactoring Tools** 2021
   by A. M. Eilertsen and G. C. Murphy, in Proceedings of the 2021 IEEE International Conference on Software Analysis, Evolution and Reengineering (SANER'21)
   Included writing Python scripts for analyzing data and generating diagrams and using Google Sheets scripts with Zapier to generate Trello cards for analysis purposes automatically.
5. **Predictable, Flexible or Correct: Trading off Refactoring Design Choices** 2020
   by A. M. Eilertsen, in Proceedings of the IEEE/ACM 42nd International Conference on Software Engineering Workshops (ICSEW'20)
6. **Refactoring Operations Grounded in Manual Code Changes** 2020
   by Anna Maria Eilertsen, in Companion Proceedings of 2020 IEEE/ACM 42nd International Conference on Software Engineering (ICSE-Companion'20)
7. **Exploring API/Client Co-evolution** 2018
   by A. M. Eilertsen, A. H. Bagge, in Proceedings of the 2018 IEEE/ACM 2nd International Workshop on API Usage and Evolution (WAPI '18)
8. **Safer refactorings** 2016
   by A. M. Eilertsen, A. H. Bagge, V. Stolz, in: Leveraging Applications of Formal Methods, Verification and Validation: Foundational Techniques (ISoLA'16)
   Included the development of a custom Eclipse plugin for refactoring application.
9. **Nerding for Newbies 2014 A Summer School in Computers & Programming** 2014
   by M.L. Bagge, A.H. Bagge, B.N. Buanes, A.M. Eilertsen, A.K. Herland, S. Ivanova, at Norsk Informatikkonferanse (NIK'14)
10. **A Sage library for analysis of nonlinear binary mapping** 2014
    by A.M. Eilertsen, O. Kazymyrov, V. Kazymyrova, M. Storetvedt, in Pre-proceedings of Central European Conference on Cryptology (CECC'14), *Documentation of a Python algebra library.*