Charles Koutcheme 03.2026

Graduate Researcher
Department of Computer Science, Aalto University
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Curriculum Vitae

My research focuses on natural language processing and machine learning for programming education, with an emphasis on automated programming feedback generation, open-weight language model fine-tuning, and scalable AI-assisted learning systems.

Education

Doctor of Science (Technology), Aalto University, Espoo, Finland 03.2026

Master of Science in Computer Science, University of Liège, Liège, Belgium 09.2021
Summa cum laude

Bachelor of Science in Computer Science, University of Liège, Liège, Belgium 07.2019
Cum laude

Research Experience

Visiting Student Researcher, Stanford University, Stanford, USA 04.2025 - 06.2025
Department of Computer Science, Piech Lab · Host: Prof. Chris Piech

Research Assistant, Aalto University, Espoo, Finland 02.2021 - 09.2021
Department of Computer Science, LeTech Research Group

Research Intern, EVS Broadcast Equipment, Liège, Belgium 06.2020 - 08.2020
Innovation Research Team

Teaching Experience

Head Teaching Assistant, Aalto University, Espoo, Finland 2024
Software Design and Modelling, Department of Computer Science

Teaching Assistant, Aalto University, Espoo, Finland 2022, 2023
Software Design and Modelling, Department of Computer Science

Teaching Assistant, University of Liège, Liège, Belgium 2017, 2018
Introduction to Programming, Montefiore Institute

Research Supervision

Master's Thesis Advisor, Aalto University, Espoo, Finland 2024
L. Pasquarelli · led to a publication at FIE 2025

Master's Thesis Advisor, Aalto University, Espoo, Finland 2023
K. J. Kulangara

Publications

Conference Publications

C. Koutcheme, J. Woodrow, C. Piech: Aligning Small Language Models for Programming Feedback: Towards Scalable Coding Support in a Massive Global Course. In *57th ACM Technical Symposium on Computer Science Education* (SIGCSE TS '26), February 2026

L. Lee Solano, C. Koutcheme, J. Leinonen, A. Vassar, J. Renzella: Fine-Tuning Open-Source Models as a Viable Alternative to Proprietary LLMs for Explaining Compiler Messages. In *57th ACM Technical Symposium on Computer Science Education* (SIGCSE TS '26), February 2026

L. Pasquarelli, C. Koutcheme, A. Hellas: AI Chatbots vs. Traditional Search: A Comparative Study on Student Information Retrieval. In *IEEE Frontiers in Education Conference* (FIE 2025), 2025

C. Koutcheme, N. Dainese, S. Sarsa, A. Hellas, J. Leinonen, S. Ashraf, P. Denny: Evaluating Language Models for Generating and Judging Programming Feedback. In *56th ACM Technical Symposium on Computer Science Education* (SIGCSE TS '25), February 2025

T. Lehtinen, C. Koutcheme, A. Hellas: Let's Ask AI About Their Programs: Exploring ChatGPT's Answers to Program Comprehension Questions. In *46th International Conference on Software Engineering: Software Engineering Education and Training* (ICSE-SEET '24), May 2024

C. Koutcheme, N. Dainese, S. Sarsa, A. Hellas, J. Leinonen, P. Denny: Open Source Language Models Can Provide Feedback: Evaluating LLMs' Ability to Help Students Using GPT-4-As-A-Judge. In *ACM Conference on Innovation and Technology in Computer Science Education* (ITiCSE '24), July 2024

A. Hellas, J. Leinonen, S. Sarsa, C. Koutcheme, L. Kujanpää, J. Sorva: Exploring the Responses of Large Language Models to Beginner Programmers' Help Requests. In *ACM Conference on International Computing Education Research* (ICER '23), August 2023

C. Koutcheme, S. Sarsa, J. Leinonen, L. Haaranen, A. Hellas: Evaluating Distance Measures for Program Repair. In *ACM Conference on International Computing Education Research* (ICER '23), August 2023

C. Koutcheme, S. Sarsa, J. Leinonen, A. Hellas, P. Denny: Automated Program Repair Using Generative Models for Code Infilling. In *Artificial Intelligence in Education* (AIED 2023), June 2023

C. Koutcheme: Training Language Models for Programming Feedback Using Automated Repair Tools. In *Artificial Intelligence in Education* (AIED 2023), June 2023

S. Sarsa, J. Leinonen, C. Koutcheme, A. Hellas: Speeding Up Automated Assessment of Programming Exercises. In *Conference on United Kingdom & Ireland Computing Education Research* (UKICER '22), September 2022

C. Koutcheme, A. Tilanterä, A. Peltonen, A. Hellas, L. Haaranen: Exploring How Students Solve Open-ended Assignments: A Study of SQL Injection Attempts in a Cybersecurity Course. In *Innovation and Technology in Computer Science Education* (ITiCSE '22), July 2022

C. Koutcheme, S. Sarsa, A. Hellas, L. Haaranen, J. Leinonen: Methodological Considerations for Predicting At-risk Students. In *Australasian Computing Education Conference* (ACE '22), February 2022

Workshop Publications

C. Koutcheme, N. Dainese, A. Hellas: Direct Repair Optimization: Training Small Language Models for Educational Program Repair Improves Feedback. In *20th Workshop on Innovative Use of NLP for Building Educational Applications* (BEA 2025), July 2025

C. Koutcheme, N. Dainese, A. Hellas: Reinforcement Learning for Programming Feedback: Aligning Small Language Models Without Human Preferences. In *9th Educational Data Mining in Computer Science Education Workshop* (CSEDM 2025), July 2025

C. Koutcheme, N. Dainese, A. Hellas: Using Program Repair as a Proxy for Language Models' Feedback Ability in Programming Education. In *19th Workshop on Innovative Use of NLP for Building Educational Applications* (BEA 2024), June 2024

C. Koutcheme, J. Leinonen, J. Sorva, A. Hellas: Analyzing Fine-Grained Material Usage Behavior. In *Seventh SPLICE Workshop at SIGCSE 2021*, March 2021

Theses

C. Koutcheme: Towards Automated Programming Feedback with Open-Weight Language Models. Doctoral Thesis, Aalto University, Espoo, Finland, March 2026

C. Koutcheme: Understanding Student Behaviours When Learning Online Materials Using Fine-Grained Browsing Data. Master's Thesis, Aalto University, Espoo, Finland, July 2021

Awards

Best Computer Science Master's Thesis, University of Liège 2021

Talks

Invited Talk, University of California Berkeley, Berkeley, USA 05.2025
Towards High-Quality Programming Feedback Using Small Language Models
Algorithms & Computing for Education (ACE) Lab

Seminar Talk, Stanford University, Stanford, USA 04.2025
Towards High-Quality Programming Feedback Using Small Language Models
Researching, Presenting and Publishing Work in AI & Education

Invited Talk, North Carolina State University, Raleigh, USA 08.2023
Advances in Programming Feedback Generation using Open Language Models
AI-Assisted Learning Lab (AIAL)

Academic Service

Reviewer
International Journal of Artificial Intelligence in Education (IJAIED)
Workshop on Innovative Use of NLP for Building Educational Applications (BEA)
International Conference on Artificial Intelligence in Education (AIED)
International Conference on Educational Data Mining (EDM)

Languages

French: Native (C2)
English: Excellent (C1)
Dutch: Moderate (B2)