

Curriculum Vitae

1. Personal details and the date of the CV

- Full name: **Jormanainen, Ilkka Johannes** (male)
- Date and place of birth: July 17, 1979, Kitee, Finland
- Citizenship: Finnish
- Current residence: Kylmäojantie 86, FI-80710 Lehmo, Finland
- ORCID: 0000-0003-3254-2480
- Modified: February 4, 2022

2. Degrees

- **Ph.D.**, University of Eastern Finland, Computer Science, 2014. *Supporting teachers in unpredictable robotics learning environments*. Verification: Student and learning services, University of Eastern Finland, tel: +358 294 458 263, email: opiskelu@uef.fi
- **M.Sc.**, University of Joensuu, Computer Science, 2004.
- **Title of Docent** (Technologies for Learning and Development), University of Turku. Date of grant: January 12, 2021

3. Other education and expertise

- Minor subject (35 credit units / 70 ECTS cps) "Computer Aided Instruction (CAI)", as part of M.Sc. studies, completed with degree "Excellent Knowledge"

4. Language skills

- Native language: Finnish
- English: Fluent (C1 level; primary written and spoken working language)
- Swedish: Fair (A2 level)

5. Current employment

- **Senior researcher** (Academy of Finland, ProFi IV funds), Technologies for Learning and Development research group, School of Computing, University of Eastern Finland, 1.3.2019 – 31.8.2022
- **University lecturer**, School of Computing, University of Eastern Finland, 1.8.2021 – (currently on leave of absence)
- Lead of the Computing Education Research Focus Group in our research lab
- Academic career in Stage III
- Responsible project leader at UEF: TRUE - Transparency of Learning Outcomes through Blockchain Technology (Erasmus+ KA2 Strategic Partnership 2020-1-PT01-KA203-078421), 12/2020 - to date

6. Previous work experience

- Responsible project leader at UEF: RoboSTEAM - Integrating STEAM and Computational Thinking development by using robotics and physical devices (Erasmus+ KA2 Strategic Partnership 2018-1-ES01-KA201-050939), (2018 – 5/2021)
- Post-doctoral researcher, edTech research group, University of Eastern Finland, School of Computing (3/2015 - 2/2019)
- Principal investigator / responsible project leader at UEF: ICT4EEDU - Strengthening ICT in Education in Eritrea, (HEI ICI Eritrea Program, CIMO / Ministry of Foreign Affairs in Finland)
- Part-time research consultant, Design and development project for a learning environment for reducing carbon footprint at Karhunmäki primary school, City of Joensuu, 2017
- Principal investigator / responsible project leader at UEF: CONSTRUIT! (Erasmus+ KA2 Strategic Partnership 2014-1-UK01-KA200-001818), TACCLE3 - Coding (Erasmus+ KA2 Strategic Partnership 2015-1-BE02-KA201-012307), 2015 - 2017
- Project manager, Congregational Mobile Technologies (Seurakunnalliset mobiiliteknologiat) project, School of Computing, University of Eastern Finland, 4/2013 - 2/2015
- Executive Director, producer of SciFest festival, 1/2013 - 4/2013, Joensuun Tiedeseura - Joensuu Science Society ry
- University lecturer, 9/2012 - 12/2012, University of Eastern Finland, School of Computing
- Short-term consultant (educational technology), 11/2010 - 2/2011, I4DPeople Ltd.
- Executive Director, producer of SciFest festival, 1/2010 - 8/2012, Joensuun Tiedeseura - Joensuu Science Society ry
- Assistant, senior assistant, University of Joensuu, Department of Computer Science, 9/2007 - 12/2009
- Researcher, Project Manager, University of Joensuu, Department of Computer Science and Statistics, Technologies and technology education for children with individual needs project (funded by European Social Fund), 12/2006 - 8/2007
- Marking Assistant, The Department of Information Systems, Massey University, New Zealand, 5/2006 - 9/2006
- Assistant, University of Joensuu, Department of Computer Science, 9/2005 - 12/2005
- Project researcher, University of Joensuu, Department of Computer Science, Development project for technology education (funded by European Social Fund), 6/2003 - 8/2005
- Teacher (partially part-time), 10/2001 - 6/2003, Virtual Approbatur, University of Joensuu, Department of Computer Science

7. Research funding and grants

R&D project funding (total 1 555 792 €)

- 2018 – 2021 RoboSTEAM – Integrating STEAM and Computational Thinking development by using robotics and physical devices, Erasmus+ KA2 (2018-1-ES01-KA201-050939), 35 222 € (UEF funding), UEF applicant and principal investigator
- 2019 SciBotania – Ubiquitous and Context-Aware Learning Environment for Botanical Gardens, Finnish Cultural Foundation, North Karelia regional fund and the Regional Council North Karelia, 15 000 EUR, main applicant
- 2019 Learning Analytics Toolkit for Moodle, University of Eastern Finland, Learning environment development fund, 8 000 EUR, main applicant
- 2017 – 2018 eCraft2Learn – Digital Fabrication and Maker Movement in Education, Horizon 2020 research and innovation framework, initiator of the application; task leader in a work package, total project fund 1 943 248 EUR, UEF share 356 246,75 €
- 2016 – 2018 ICT4EEDU – Strengthening ICT in Education in Eritrea, HEI-ICI, Finnish Ministry of Foreign Affairs, 449 756,73 €, principal project leader
- 2016 – 2018 TACCLE3 – Coding, Erasmus+ KA2 (2015-1-BE02-KA201-012307), 25 459 € (UEF funding), UEF applicant, project leader
- CONSTRUIT! – Making construals as a new digital skill for creating interactive open educational resources, Erasmus+ KA2 (2014-1-UK01-KA200-001818), UEF funding 111 609 €, UEF main applicant and leader of the project
- 2015 TopMob – a mobile learning environment for university students' practical training periods, University of Eastern Finland, Learning environment development fund, 6 500 EUR, main applicant
- 2013 – 2015 Congregational Mobile Technologies, European Social Fund (ELY Centre of North Karelia) and The Church Council, 488 000 EUR, main applicant, project leader
- 2014 – 2015 RobotStory: Digital storytelling and theater performance with educational robotics, Technology Industries of Finland Centennial Foundation, 60 000 EUR, main applicant, project leader

Development funds

- 2007-22 SciFest festival for science and technology, total funding 2,5 M€ (contributions in various levels in application processes)

PhD research grants

- 2007: Research Scholarship, 16 000 EUR, Finnish Cultural Foundation, North Karelian regional fund
- 2006-7: PhD Scholarship, 1 150 EUR / month, University of Joensuu, Faculty of Science
- 2005: Freemover grant, 1 400 EUR, Rector of University of Joensuu

8. Research output

- Scientific work since 2001
 - Book chapters, peer-reviewed: 2
 - Journal articles, peer-reviewed: 7
 - Conference publications, peer-reviewed: 51

- Monographs: 2
- Other publications: 3
- Total citations (Google Scholar): 948, h-index 14, i10-index 22

List of 10 most important publications covering the research activities

Yigzaw, S., **Jormanainen, I.**, & Tukiainen, M. (2021). Knowledge Sharing in the Higher Education Environment of Developing Economies – The Case of Eritrea. *The African Journal of Information Systems*, 13(3), Article 6.

Tedre, M., Toivonen, T., Kahila, J., Vartiainen, H., Valtonen, T., **Jormanainen, I.**, & Pears, A. (2021). Teaching machine learning in K–12 classroom: Pedagogical and technological trajectories for artificial intelligence education. *IEEE Access*, vol. 9, 110558-110572.

Jormanainen, I., & Tukiainen, M. (2020). Attractive Educational Robotics Motivates Younger Students to Learn Programming and Computational Thinking. In *Eighth International Conference on Technological Ecosystems for Enhancing Multiculturality (TEEM'20)*, October 21–23, 2020, Salamanca, Spain. ACM, New York, NY, USA, 7 pages. **Best paper award.**

Mariescu-Istodor, R., & **Jormanainen, I.** (2019). Machine Learning for High School Students. In *Proceedings of 19th Koli Calling International Conference on Computing Education Research*. Article No. 10. ACM, New York, NY, USA. **Best presentation award.**

Toivonen, T., & **Jormanainen, I.** (2019). Evolution of Decision Tree Classifiers in Open Ended Educational Data Mining. In *Proceedings of the Seventh International Conference Technological Ecosystems for Enhancing Multiculturality (TEEM '19)* (pp. 290-296). ACM, New York, NY, USA. **Best paper award.**

Toivonen, T., **Jormanainen, I.**, & Tukiainen, M. (2019). Augmented Intelligence in Educational Data Mining. In *Smart Learning Environments*, 6(10), 25 pages.

Saqr M., Nouri J., & **Jormanainen I.** (2019) A Learning Analytics Study of the Effect of Group Size on Social Dynamics and Performance in Online Collaborative Learning. In Scheffel M., Broisin J., Pammer-Schindler V., Ioannou A., Schneider J. (eds) *Transforming Learning with Meaningful Technologies Proceedings of Fourteenth European Conference on Technology Enhanced Learning (EC-TEL 2019)* (pp. 466-479). Lecture Notes in Computer Science, vol 11722. Springer, Cham.

García-Peñalvo, F.J., Rees, A. M., Hughes, J., **Jormanainen, I.**, Toivonen T., & Vermeersch, J. (2016). A survey of resources for introducing coding into schools. In *Proceedings of the Fourth International Conference Technological Ecosystems for Enhancing Multiculturality (TEEM '16)* (pp. 19-26), New York, NY, USA: ACM.

Jormanainen, I., & Sutinen, E. (2014). Role blending in a learning environment supports facilitation in a robotics class. In *Journal of Educational Technology & Society*, 17(1), 294-306.

Jormanainen, I., & Sutinen, E. (2012). Using Data Mining to Support Teacher's Intervention in a Robotics Class. In *Proceedings of Fourth IEEE International Conference on Digital Game and Intelligent Toy Enhanced Learning* (pp. 39-46). Los Alamitos, California: IEEE Computer Society.

9. Research supervision and leadership experience

Supervised PhD theses

- Tapani Toivonen: "Open Machine Intelligence in Education", graduated 10/2020, University of Eastern Finland. Thesis approved with distinction.
- Supervisor of eight active UEF SCITECO PhD students from Eritrea, Namibia, Uganda, Ghana, and Finland.

Supervised MSc theses

- Aaro Alhainen: "Opiskelijoiden oppimistulosten ennakointi koneoppimisen menetelmillä", graduated 10/2021, University of Eastern Finland
- Natnael Yacob Asgedom: "Robotic and block-based programming with Text Interpreter for motivating novice programmers", graduated 10/2021, University of Eastern Finland
- Salseng Mrong: "Visualization of the Artificial Neural Network for Machine Learning novices", graduated 3/2021, University of Eastern Finland
- Teemu Airaksinen: "Työpöytäsovelluksen ja verkkosovelluksen vertailu käytettävyyden näkökulmasta", graduated 12/2020, University of Eastern Finland
- Ville Mustonen: "HOPLAA! Liikuntaa pelillistävän mobiilisovelluksen toteutus ja tuotetun datan analyysi," graduated 12/2020, University of Eastern Finland
- Sha Md. Nayeem: "Updating Machine Register with Robotic Process Automation", graduated 10/2020, University of Eastern Finland
- Joel Jumppanen: "Games in informatics technology education", graduated 2/2018, University of Eastern Finland
- Tapani Toivonen: "Extending Empirical Modelling with a physical computing framework", graduated 6/2016, University of Eastern Finland
- Pasi Saukkonen: "Encountered problems with iPads in teaching in Finland", graduated 12/2015, University of Eastern Finland
- Ville Räisänen: "Efficiency and battery usage in Android apps", graduated 12/2015, University of Eastern Finland
- Mikko Laamanen: "Architecture of theatre robotics", University of Eastern Finland, graduated 3/2015, University of Eastern Finland

10. Teaching merits

- 2019: Invited course on educational robotics, University of Turku overseas campus at University of Namibia, Windhoek, Namibia
- 2015-17: Intensive courses on educational technologies, edtech laboratory functions, and mobile programming, Eritrea Institute of Technology, Eritrea, ICT4EEDU HEI-ICI Eritrea project, funded by Ministry of Foreign Affairs, Finland
- 2010, 2011: Intensive courses on technology education and robotics, I4D People Ltd, Initiation of Kids' Club Mozambique living lab project under STIFIMO programme, Maputo and Nampula, Mozambique
- 2010: Lecturer and course coordinator, ICT for Job Creation intensive course, University of Pretoria, South Africa, OpenDoors network, CIMO North-South-South mobility program

- 2009, 2010: Visiting teacher on technology education, Lusaka, Zambia, TEDITE project, Evangelical Folk High School of Kitee
- 2009: Lecturer and course coordinator, ICT for Creative Business Planning intensive course, Purbanchal University, Biratnagar, Nepal, OpenDoors network, CIMO North-South-South mobility program
- Various courses at the University of Joensuu / University of Eastern Finland
 - 2020-21, lecturing and exercise groups, Robotics and XR
 - 2019-21, lecturing and exercise groups, State-of-the-art technologies in Digital Learning Environments
 - 2015-20, principal teacher in online course, Human Factors of Interactive Technology
 - 2018, lecturing and exercise groups, Robotics
 - 2017-19, contact teacher for the first year programming courses, Programming I - III
 - 2017, lecturing and exercise groups, Programming II (object-oriented programming in Java)
 - 2016, lecturing and exercise groups, Robotics and embedded systems
 - 2012, lecturing and exercise groups, Introduction to programming
 - 2008, co-lecturing Introduction to programming with prof. Erkki Sutinen, exercise groups of the course
 - 2001-3, programming courses at the Virtual Approbatur program
 - 2000-3, exercise groups on courses of IT passport program
- 2001-14: Development of SciKids' (formerly known as Kids' Club) technology education framework, regular teaching and tutoring in various SciKids' technology clubs and intensive camps

11. Awards and honours

- 2020: Best Paper Award for Computational Thinking and Robotics in Education track, 8th International Conference on Technological Ecosystems for Enhancing Multiculturality (TEEM 2020)
- 2019: Best Presentation Award, 19th Koli Calling International Conference on Computing Education Research
- 2019: Best Learning Analytics Paper Award, 7th International Conference on Technological Ecosystems for Enhancing Multiculturality (TEEM'19)
- 2018: Best Poster Award, 18th Koli Calling International International Conference on Computing Education Research
- 2004: Fast Master award, 600 EUR, University of Joensuu, Department of Computer Science

12. Other key academic merits

- External reviewer of the PhD Thesis "Contribution to the understanding, creation and conduction of technology-enhanced educational escape rooms", Universidad Politécnica de Madrid, Spain (2021)
- Guest editor, Special issue of Applied Sciences: "Intelligent Robotics Education" (2021)
- Opponent of a doctoral dissertation ("Possibilities of Bodily Learning in Science Education"), Faculty of Information Technology, University of Jyväskylä (December 2020)
- Reviewer for funding application, The Dutch Research Council (2020)
- Local chair, Koli Calling International Conference on Computing Education Research (2010 – 2021)

Program committee member / peer reviewer in the following conferences and scientific publications

- ACM International Computing Education Research Conference (ICER)
- Computers & Education
- Computers in Human Behavior
- DEANZ Conference (The New Zealand association for professionals working in flexible, open and networked education)
- EDUROBOTICS International Conference
- IEEE International Conference on Advanced Learning Technology (ICALT)
- IEEE International Workshop on Wireless, Mobile and Ubiquitous Technologies in Education (WMUTE)
- IEEE Transactions on Education
- Informatics in Education journal
- International Conference on Computers in Education (ICCE)
- International Koli Calling Conference on Computing Education Research
- International Journal of Social Robotics
- Journal of Educational Technology and Society
- Journal of Advanced Technology for Learning
- Smart Learning Environments journal
- Work abroad, research visits, invited talks abroad

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- 2016: Invited talk: Arts Meet Robot - Toward Inclusive STEAM Education, The EDUROBOTICS 2016 International conference, Athens, Greece
- 2012: Invited workshop leader, Workshop A - The Content: The Relevance of Content - Shilly-shallying vs. Critical Thinking, SiS Catalyst / EUCU.NET joint conference, University of Porto, Portugal
- 2009: Visiting researcher (four weeks), Meraka Institute, CSIR, South Africa
- 2009: Research visit, University of Warwick, UK

- 2008: Erasmus teacher exchange visit, University of Warwick, UK
- 2006: Visiting PhD student, Advanced Learning Technologies Research Centre, the Department of Information Systems, Massey University, New Zealand

Academic organizational duties

- 2019 - Joensuun Tiedeseura - Joensuu Science Society ry, Vice-chair
- 2009 - Joensuun Tiedeseura - Joensuu Science Society ry, Board member
- 2003 - 2004: Student Union of University of Joensuu, Board member
- 2008 - 2010: Administrative Coordinator, University of Eastern Finland (University of Joensuu), OpenDoors network, CIMO North-South-South mobility program
- 2003 - 2005, 2007 - 2014: Head of organizing committee, Koli Calling International Conference on Computing Education Research
- 2004: Member of steering and program committees, JoyOodi project, University of Joensuu
- 2002 - 2003: Member of Departmental council, University of Joensuu, Department of Computer Science

13. Scientific and societal impact

- Treasurer, board member, The Finnish Society for Computer Science (2019 – 2021)
- I was working in 2010-2013 as Executive Director of Joensuu Science Society organizing SciFest Finland (<https://www.scifest.fi>), a landmark science and technology festival aimed at youngsters. SciFest was started in 2007 and has been organized annually, gathering annually more than 10 000 participants.
- Responsible program producer for SciFest festivals since 2010.
- Founding member and currently vice-chair and board member of Joensuu Science Society.