FORTH

INSTITUTE OF COMPUTER SCIENCE

workshop

Gender Issues in Computer Science

Diversity
Equity
Inclusivity

and more Research in Computer Science

Thursday 27 February 2025, 14:30 - 17:45

Auditorium "Georgios Lianis", FORTH, Main Building

- Registration *(Google Forms)*
- Remote participation *(Zoom)*

Gender Equality and anti-Discrimination Committee
FOUNDATION FOR RESEARCH & TECHNOLOGY - HELLAS

Association for Computing Machinery

workshop

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Diversity, Equity, Inclusivity
and more Research in Computer Science

27 Feb 2025

14:30 - 14:40 **WELCOME by**
Prof. Dimitris Plexousakis, Director of Computer Science Institute
the FORTH's Gender Equality&Anti-Discrimination Committee

14:40 - 16:30 **KEYNOTE**
"Software Engineering and Gender: A Tutorial"
Prof. Letizia Jaccheri, Department of Computer Science of the Norwegian University of Science and Technology
supported by the **ACM Distinguished Speaker Program**

- Presentation session: introduction, key concepts *(50 min)*
- Break *(10 min)*
- Interactive session: state of the art of software engineering gender studies *(40 min)*
- Feedback and closing *(10 min)*

16:30 - 16:50 **BREAK**

16:50 - 17:45 **ROUND TABLE**: Gender Sensitive Research and Innovation @FORTH-ICS

- Identify Gender Bias in AI and Machine Learning *(10 min)*
  Dr. Panagiotis Papadakos (Post-Doctoral Scientist, PhD)
- Promoting inclusion, diversity and non-discrimination through educational software *(10 min)*
  Dr. Giorgos Giannakakis (Senior Technical Staff, PhD)
- Gender Dimensions in Generative AI for Image and Video Synthesis *(10 min)*
  Dr. Anastasios (Tassos) Roussos (Principal Researcher, PhD)
  Ms. Paraskevi Valergaki (Graduate Student MSc.)
- Equal Minds, Equal Code. FORTH-ICS steps to Inclusive Computer Science *(10 min)*
  Ms. Magdalini Chatzaki (Staff, MSc.)
- Questions, Discussion and closing *(15 min)*

program

SOFTWARE ENGINEERING AND GENDER: A TUTORIAL

Software runs the world and should provide equal rights and opportunities to all genders. However, the gender gap exists in the software engineering workforce and many software products are still gender biased. This tutorial aims to present a set of scientific studies based on qualitative and quantitative research methods.

This work contributes to raising awareness about gender gap prevalent in the software industry. The goal of this tutorial is to learn about software engineering and gender and to discuss the state of the art of gender issues in core topics of software engineering. The tutorial will provide participants with a clear definition and understanding of Software Engineering and gender and explain the origins and historical context that led to the emergence of this concept. The tutorial promotes inclusivity by illustrating how feminist principles can be applied in software engineering and showcases examples of inclusive software design and coding practices that align with Feminism concepts.

INTENDED AUDIENCE AND REQUIRED BACKGROUND

The intended audience for this tutorial includes researchers, software engineers, policy-makers, educators, university students of all levels as well as anyone who is interested in the intersection of technology and social issues.

FORMAT AND DURATION

The tutorial will consist of a 45-minute lecture and a 45-minute hands-on session. The lecture will give an overview of the state of the art in gender in SE, discuss important topics related to diversity and inclusion in software development, and discuss gender bias in AI development and operations.

Format: lecture, hands-on session, discussion.

Intended duration: 120 minutes.

KEY LEARNING OBJECTIVES

Throughout this tutorial, participants can expect to learn the following key points:

- Main concepts of the intersection between software engineering and gender
- Existing research studies about gender and software engineering
- How to set up a research study about gender and software engineering and/or an intervention
- Existing research about gender bias in modern AI
- Intersectionality (feminism)-a theory to understand the interplay between gender, technology, biases

RELEVANT PUBLICATIONS

Jaccheri, Letizia, Cristina Pereira, and Swetlana Fast. "Gender issues in computer science: Lessons learnt and reflections for the future". *2020 22nd international symposium on symbolic and numeric algorithms for scientific computing (SYNASC)*. IEEE, 2020.

Jaccheri, Letizia, and Anh Nguyen Duc. "Software Engineering and Gender: A Tutorial". *Companion Proceedings of the 32nd ACM International Conference on the Foundations of Software Engineering*. 2024.

Rubegni, Elisa, Monica Landoni, and Letizia Jaccheri. "Design for change with and for children: how to design digital storytelling tool to raise stereotypes awareness". *Proceedings of the 2020 ACM designing interactive systems conference*. 2020.

Prof. Letizia Jaccheri

Department of Computer Science of the Norwegian University of Science and Technology

Letizia Jaccheri is a Professor at the Department of Computer Science of the Norwegian University of Science and Technology (link www.ntnu.edu), Norway. Jaccheri has been teaching courses in software engineering at various levels. From 2013 to 2017 she was department head for the Computer Science department at NTNU. She is ACM Distinguished speaker since 2018. She has got two gender equality prizes for her work to attract and retain women to computer science. Letizia Jaccheri has a long record of research leadership in interdisciplinary projects with a focus on gender and software engineering. She is in involved in several research projects, and she is the chair of the COST Action CA19122 Gender Balance in Informatics EU GAIN (link eugain.eu) with 155 members from 39 European countries (2020-2024). Letizia has plans to continue to contribute to address the issue of diversity in software engineering.

IDENTIFY GENDER BIAS in AI and MACHINE LEARNING

We live in an information age where most of our information and communication needs are satisfied by on-line systems like search engines, social networks and news portals. These platforms use sophisticated Machine- and Deep-Learning for filtering, ranking, recommendation, and automated text generation purposes to satisfy their users, shaping their opinions and guiding their decisions on everyday matters.

At the same time, the users of these platforms not only consume, but also produce information through the content they contribute, as well as the relationships they form, the choices they make, and the actions they take. This data is then used to fuel and train the algorithms in an iterative process. However, this circle is susceptible to the presence of bias in the behavior of human users, but also in the decisions of the deployed algorithms and models. For example, users tend to create connections with like-minded individuals, favoring content that reinforces their current opinions. Thus, human biases produce biased training data, while algorithmic biases reinforce the input biases and expose them to the users of the online platforms.

The concerns about the ethics of the AI and Machine Learning algorithms have led to the rise of the field of Fair and Accountable AI. Research in this field aims to define the notions of fairness and bias for different AI algorithms and measure them in practice, including human biases that emerge in social networks. Based on them, the goal is to provide a formal way to measure the systemic and human biases, such as gender biases in this case, in the different parts of the process, model their emergence, and propose algorithmic techniques for alleviating their effect in different stages of the pipelines. This will result in the deployment of algorithms that have measurable guarantees about the fairness or bias of their results.

Dr. Panagiotis Papadakos
Post-Doctoral Scientist, PhD

Dr. Panagiotis Papadakos (m) is a postdoctoral scientist at FORTH-ICS. He got his Ph.D. in computer science from the University of Crete, Greece, in 2013. The title of his Ph.D. dissertation is 'Interactive Exploration of Multidimensional Information Spaces with Preference Support'. His main research interests lie in the areas of information retrieval, dialogue systems, and the semantic web, with a focus on exploratory search, and bias and deception issues in online information. He has published more than 40 papers in peer-reviewed conferences, workshops, and journals, and has received the best long paper award in ECIR 2020 for his work on bias goggles. He has also contributed as a reviewer and PC member in prestigious conferences and journals (WWW, WSDM, CIKM, SIGKDD, ECIR, KNOSYS). Panagiotis has been involved in various national and European projects, like the EU's H2020 flagship AI project AI4EU. Finally, he has also served as a visiting lecturer in the Computer Science Department of the University of Crete from 2015-2021, teaching the undergraduate courses of Web Programming and Information Retrieval, and the graduate course of Advanced Information Retrieval.

PROMOTING INCLUSION, DIVERSITY AND NON-DISCRIMINATION THROUGH EDUCATIONAL SOFTWARE

According to the United Nations and EU observatory, discrimination (racial, gender-based, political, religious, etc.) still affects many young people, especially young women. Equal opportunities and access to rights need to be ensured for young people of all genders and social groups, including people with particularities. It is recognized that education remains key to active citizenship, inclusive society, and employability, and, therefore, education should focus more on transferable skills, student-centered learning, and non-formal education.

Nowadays, fighting discrimination through diversity, inclusion, and acceptance is crucial for an evolving and modern education system and an open-minded society. Students belonging to marginalized minorities, students with special educational needs, women, members of the LGBTQI community or just students with minor diversity and acceptance issues comprise a high percentage of the schools' dynamics. This can lead to various forms of self-rejection and to severe psychological and behavioral problems and needs to be addressed in a discrete and contemporary way.

In schools, a lot needs to be done to reach the desired level of recognition and acceptance, including inclusion and acceptance of diversity. STEAM educational framework can be quite flexible and supportive of curriculum and educational software due to their interactive nature, providing a robust and efficient way of promoting notions of inclusion and equity in the school environment.

As a use case, notions and parts of the relevant funded project STEAMDIVE: Diversity in STEAM will be presented (https://steamdive.eu).

Dr. Giorgos Giannakakis
Senior Technical Staff, PhD

Giorgos Giannakakis is a Research Associate at the Institute of Computer Science, Foundation for Research and Technology Hellas (FORTH) and a collaborating Researcher at the Institute of AgriFood and Life Sciences, University Research Centre, Hellenic Mediterranean University.

He received his Dipl.-Ing. in Electrical and Computer Engineering from the National Technical University of Athens (NTUA) in 2003, his MSc and PhD in Biomedical Engineering from the Faculty of Medicine of the University of Patras – School of Electrical and Computer Engineering, NTUA in 2005 and 2009 respectively.

As a principal investigator or research team member, he has attracted external funding in 8 European/national programs and has been involved in 24 research projects (10 European, 14 national projects), serving as principal investigator in 4 research projects. His research has been recognized with awards from journals (e.g., Biomedical Signal Processing and Control, Signals, IEEE Reviews in Biomedical Engineering), institutions, international competitions (e.g. ACII2024) and scholarships (e.g., IKY postdoctoral fellowship).

He has authored over 70 publications in international journals and conferences in the fields of medical informatics, biosignal processing/analysis, computer vision, machine learning, affective computing, and computational neuroscience.

GENDER DIMENSIONS in GENERATIVE AI for IMAGE and VIDEO SYNTHESIS

In recent years, generative artificial intelligence (AI) for image and video synthesis has made impressive advancements, sparking widespread interest and public debate. Today's AI systems can automatically generate images and videos that rival the quality of real photographs and videos as well as human-drawn art. These AI systems are now very widely used, resulting in an immense volume of AI-generated content online. It is therefore of paramount importance to consider the social impact of these systems, including their impact on gender-related issues.

In this talk, we will explore how AI image generators perpetuate and amplify gender stereotypes, as well as strategies to mitigate these effects. Additionally, we will examine how generative AI can merge with interactive art to promote gender equality in an experiential way.

Dr. Anastasios (Tassos) Roussos

Principal Researcher, PhD

Anastasios (Tassos) Roussos is a Principal Researcher (Associate Professor level) at the Institute of Computer Science, Foundation for Research and Technology - Hellas (FORTH), Greece. Prior to his current position, he was a Lecturer (equivalent to Assistant Professor) in Computer Science at the University of Exeter and a Fellow of the Alan Turing Institute, UK. Before these positions, he was a postdoctoral researcher at Imperial College London (ICL), University College London (UCL) and Queen Mary, University of London, UK. He has studied Electrical and Computer Engineering (PhD 2010, Dipl-Ing 2005) at the National Technical University of Athens (NTUA), Greece.

Dr. Roussos' research specializes in 3D Computer Vision and Deep Learning. The focus of his current research is the development of novel methods for detailed 3D modelling, reconstruction and synthesis of real-world objects and scenes based on image data.

Dr. Roussos has published 13 articles in top-tier international journals of Computer Vision, Biometrics, Machine Learning and Imaging Sciences (IEEE TPAMI, IEEE TBIOM, Springer IJCV, JMLR, SIAM SIIMS) and 30 papers in peer-reviewed international conferences, including the top conferences of Computer Vision, Pattern Recognition and Augmented Reality (IEEE/CVF CVPR, IEEE ICCV, ACM ISMAR). He has more than 2,430 citations to his articles with an h-index of 23 and an i10-index of 33 (source: Google Scholar, December 2024).

Ms. Paraskevi Valergaki

Graduate Student MSc

Paraskevi Valergaki holds an MSc in Computer Science with a specialization in Computer and Cognitive Vision and Robotics from the University of Crete (UoC), Greece. Her research focuses on real-time 3D face manipulation, combining Generative Adversarial Networks (GANs) and 3D Morphable Models (3DMMs) to push the boundaries of interactive and realistic face transformations.

Her academic journey began at the National Technical University of Athens (NTUA), where she earned a five-year joint BSc and MEng degree in Electrical and Computer Engineering. During her time at NTUA, she developed a strong interest in artificial intelligence, neural networks, and biomedical applications, demonstrated through her thesis on using deep learning methods to diagnose COVID-19 from cough samples.

As a Research Assistant at FORTH's SteamDive Research Program, Paraskevi contributed to the development of software that utilizes state-of-the-art GANs for real-time 3D face reconstruction and texture synthesis. This innovative project enables users to explore how their appearance might change across different genders or ethnicities, highlighting her dedication to promoting inclusivity and diversity through technology. In addition to her academic and research pursuits, Paraskevi has gained valuable teaching experience, serving as a teaching assistant for various computer science courses at UoC.

EQUAL MINDS, EQUAL CODE. FORTH-ICS STEPS TO INCLUSIVE COMPUTER SCIENCE

The underrepresentation of women as well as other underrepresented groups in the scientific field of Informatics and Computer Science is recognized worldwide. Many countries, academic institutions, universities and research institutions are designing programs and actions aimed at addressing this asymmetry.

The Institute of Computer Science of the Foundation for Research and Technology Hellas (FORTH-ICS), seeks to open this discussion to its members, to its academic environment as well as to the community, with the aim of raising awareness among all parties involved, and take actions to strengthen diversity and inclusion and smooth out the phenomenon.

In line with international trends and guidelines, FORTH-ICS actively participates in the Gender Equality & Anti-Discrimination Committee of FORTH, designing and implementing guidelines, roadmaps and take actions for adapting to the European goals for gender equality in science, research and innovation fields.

Here, I will present briefly some quantitative and qualitative data for FORTH-ICS and discuss possible improvements.

Ms. Magdalini Chatzaki
Staff, MSc

Ms. Magdalini Chatzaki is a telecommunication engineer and a staff scientist of the Systems and Networks Department of FORTH-ICS. She holds a MSc. by the Computer Science Department of the University of Crete. She is currently a member of the Gender Equality&Anti-Discrimination Committee of FORTH. She is a past member of the Health and Safety Committee of FORTH.

Further to her scientific and technical work, she focuses in Science, Technology and Society issues especially in Computer Science and its social impact.