

# We, GEN Z Girls in IT

*Encouraging female students to enroll in Informatics programmes and retaining them.*

*Name of University: International University of Sarajevo, Bosnia and Herzegovina*

*Nominators:*

*Dr. Amal Mersni ([amersni@ius.edu.ba](mailto:amersni@ius.edu.ba)),*

*Dr. Ozge Buyukdagli ([obuyukdagli@ius.edu.ba](mailto:obuyukdagli@ius.edu.ba))*

*The nomination can be considered as a runner up.*

## **A Brief Summary**

The "We, GEN Z Girls in IT" initiative aims to empower students and improve the environment for women in computing in Bosnia and Herzegovina by organizing various events such as workshops, panel discussions, inspirational talks, and lectures. It has three main categories of the actions supporting the aim of this initiative:

1. introducing and promoting the STEM and ICT topics via workshops, seminars and events includes the role models from the field,
2. encouraging the existing (bachelor, master) students to be organizers and designers of the workshops for younger generations,
3. focusing on the professional development of the team to gain insights on how to implement diversity, equity, and inclusion in the academic environment.

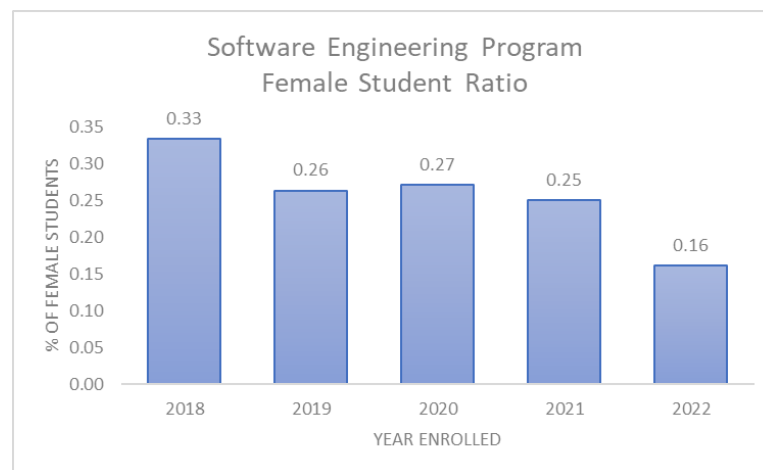
### **1. About International University of Sarajevo**

Legal procedures and regulations in Bosnia and Herzegovina (BiH) ensure that there is no discrimination against women participating in higher education. International University of Sarajevo (IUS) systematically adheres to these principles. In addition to implementing these procedures and regulations in practice, IUS has taken a step further in ensuring greater gender equality in the management of the University. Proof of this is that more than half of the managerial positions at IUS are women.

Many things regarding gender equality have improved through the Horizon2020 - SAGE project, which was implemented at IUS. Intensive work was done on structural changes and improvements in decision-making, as well as research capacities, in terms of gender representation. Gender-sensitive practices have been introduced in all segments of the University's activities and balanced representation of both women and men in institutional decision-making has been developed.

IUS has three programs related to the informatics field: Computer Sciences and Engineering, Software Engineering and Artificial Intelligence and Data Engineering. The faculty for these programs has 75% of the female staff, where for the last 7 years, Program Coordinators were always female professors.

On the other hand, the active female student ratio is on average 25% and throughout the years, this ratio is slightly decreasing. An example graph for one of the programs, Software Engineering program, is given in the graph below. The decreasing trend can be seen from the figure. As a result of this observation, the idea of embarking on a new initiative emerged, and the planning and working on the "We, GEN Z Girls in IT" initiative has started in 2022.



## 2. "We, GEN Z Girls in IT" initiative at IUS

The "We, GEN Z Girls in IT" initiative aims to empower students and improve the environment for women in computing in Bosnia and Herzegovina by organizing various events such as workshops, panel discussions, inspirational talks, and lectures.

After the establishment of the Sarajevo Association Computing Machinery-Women Professional Chapter (ACM-W) Chapter (association) and several related events, the "We, GEN Z Girls in IT" initiative was launched. Our goal was to unite these various activities under one umbrella and promote a broader engagement. This initiative includes various activities involving international organizations and EU projects such as ACM-W and European Gender Balance in Informatics (EUGAIN) COST action. The aim is to gain insights from different perspectives on how to implement diversity, equity, and inclusion in our academic environment, thereby enriching the learning experience of our female students and further promoting an inclusive environment.

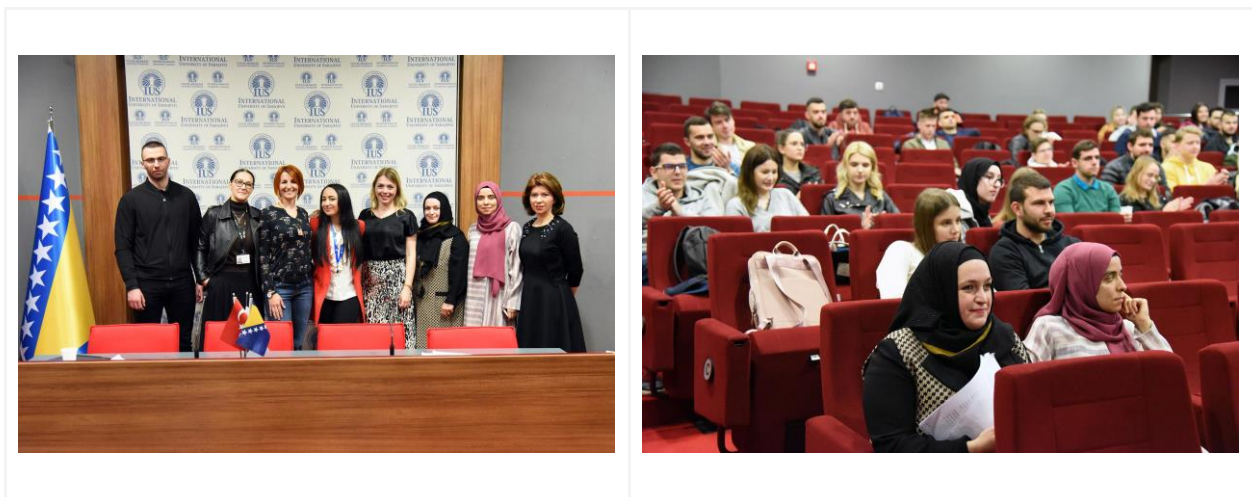
We have also integrated the United Nations Sustainable Development Goals (SDGs) into our operations, aligning with SDG 4 (quality education) and SDG 5 (gender equality) and working actively with the IUS SDG Executive Committee. By promoting equal access to quality education and training opportunities in IT-related fields for women and fostering a culture of inclusivity and

diversity, we aim to contribute to the achievement of these SDGs at our university and beyond. It is important to mention that within this initiative, we prioritize the involvement of male colleagues and students in our activities to gain their commitment to promote gender balance at all levels in the IT/ICT sectors.

### 3. Description of Initiative

As mentioned earlier, the foundation of the ACM-W Sarajevo chapter inspired and encouraged us to initiate "We, GEN Z Girls in IT", an environment where women can learn from each other and get emboldened about becoming computer scientists, particularly through workshops focused on developing academic and professional skills. By working together, we can create a more equitable and inclusive environment in computing technology., an umbrella to unite different activities that aims to empower students, especially females in IT fields.

The Sarajevo ACM-W, the first association in Bosnia and Herzegovina, was founded at our university. Our Chapter Sarajevo ACM-W was established under the auspices and with the support of ACM, the world's oldest computer science organization, founded in 1947, and the world's largest organization in the field. On April 28th, 2022, the foundation of the chapter was announced by Ms. Ruth Lennon, Chair of the ACM-W, with a memorable event International Girls in ICT Day, that was celebrated for the very first time at IUS. Girls in ICT Day Sarajevo 2022 gave us a great opportunity to bring together professionals from various IT fields who spoke to the audience and shared their knowledge and experience. Our primary goal was to encourage and inspire young women to pursue their dreams of becoming information and communications technology (ICT) professionals and to promote careers in ICT.



Girls in ICT Day Sarajevo 2022 - IUS, April 28, 2022

In the following section, we would like to highlight some of the notable workshops and events that have been successfully organized by our initiative:

**"Computer Network Fundamentals Workshop":** The Computer Network Fundamentals Workshop is organized in collaboration with MIBO Komunikacije Company that has actively built today's telecommunication and information technology market in Bosnia and Herzegovina and in the region as well and leads one of the best teams of ICT experts in BiH. The objective of this workshop is to familiarize students with the fundamentals of computer networking. The workshop will include a well-balanced blend of theoretical and practical sessions. That will certainly help students to improve their technical skill set in the field of Networking.

**"Robotics for Kids Workshop":** This workshop was organized by the chapter's senior female student members on 23<sup>rd</sup> of December 2022 and aimed to focus on introducing children to Arduino and Robotics. The impact of the initiative was significant, as the participating children thoroughly enjoyed the workshop and expressed an eagerness to participate in subsequent activities.

**"Robotics and Web Development Workshops":** Two workshops were held at IUS on 4<sup>th</sup> of March dedicated to high school students and all first-year students and they were organized in celebration of International Day of Women and Girls in Science and International Women's Day. The workshops were designed and given by the last-year undergraduate female students, which also extends the target group and impact of these workshops. In addition to the main target group which includes the young students with no or weak knowledge on IT topics, our instructors (female students) are also a target group, where they were given responsibility and opportunity to design and give their own workshops with the full support from the faculty.



Photos from workshops organized by senior female students

**"Investigating a Threat Landscape" Cybersecurity workshop:** As part of the International Women's Day celebrations at IUS, a cybersecurity workshop was held on March 10. The event was designed to raise awareness among participants about the importance of digital hygiene and taking precautions when navigating cyberspace.

**"Communicating in the cyber world" Cybersecurity workshop:** it was held at Mistral on 19 th of March and dedicated to BHFF scholars, where they were taught about digital footprint and cybersecurity.

**"Girls in ICT Sarajevo 2023"** is the second edition of the successful celebration of International ICT Girls' Day organized by Sarajevo ACM-W and held at the International University of Sarajevo. The celebration was open to everyone and all genders, took place from April 26 to 28, 2023, and included an extensive range of activities designed for different target groups. Our event included several activities such as panel discussions, inspiring speeches, technical workshops in various IT/ICT fields, and a hackathon competition.

### **EUGAIN Activities**

To expand the global scope of our initiative, we joined the EUGAIN Cost Action. EUGAIN is a COST Action (CA19122) project that aims to improve the gender balance in computing by creating and strengthening a truly multicultural European network of researchers who are at the forefront of efforts in their countries, institutions, and research communities. We will build on their knowledge, experiences, struggles, successes, and failures, learning and sharing what has worked and how it can be transferred to other institutions and countries.

Among other outcomes, EUGAIN will provide recommendations and guidance to the academic community, policy makers, industry, and other stakeholders to address the following key challenges. Dr. Mersni and Dr. Büyükdağlı played an active role in the activities of their working group-2 (WG2). The working group focuses on advancing women's participation and education in computer science, including Ph.D. programs. They aim to increase applications, ensure student success, and amplify women's voices.

Our involvement in the EUGAIN COST action continued in March and April with participation in several activities. These included participation in the annual MC member meetings, online workshops for young researchers, working group meetings, and various other related events. This active participation further enriches our initiative and its contribution to promoting diversity and inclusivity.

**EUGAIN website:** [CA19122 - European Network For Gender Balance in Informatics \(EUGAIN\)](https://eugain-project.eu/)

**Sarajevo ACM-W Chapter website:** <https://acmweurope.acm.org/newsletter-october-2022/>

## **4. Evidence of its impact**

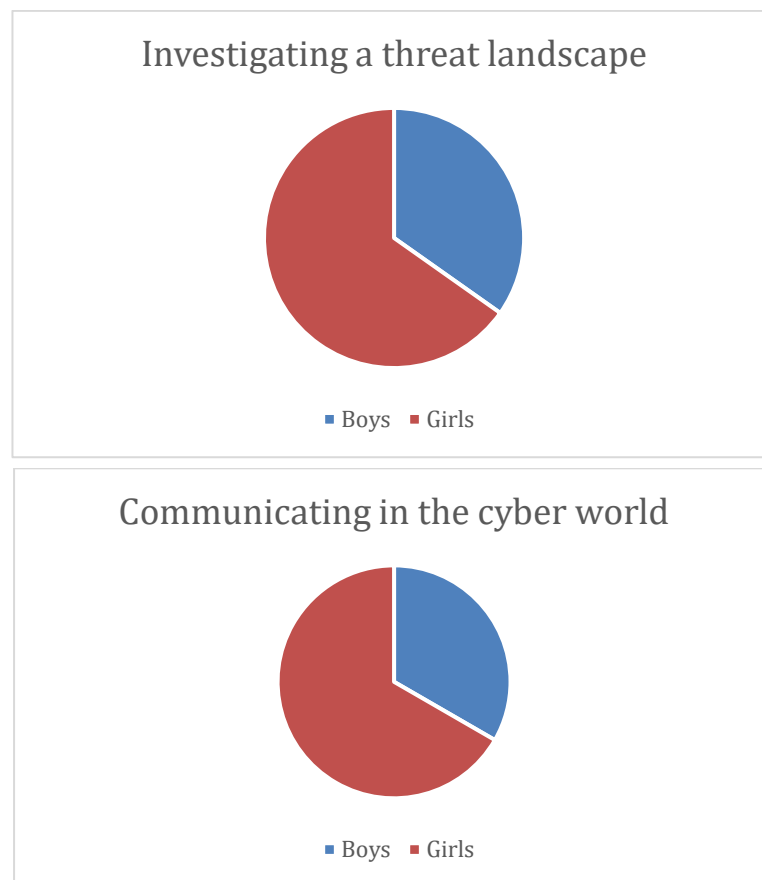
The initiative is still very young, and the long-term impact is not observed yet (in terms of the recruitment or retention numbers). But there are short term impacts already observed and they are given in this section.

Firstly, some of the statistics related to workshops are summarized in the following part:

Only 18% of students had heard of tools such as the Cisco Packet Tracer before the networking and cybersecurity workshops. All the students have found the tool easy-to-use and potentially very useful when getting educated about networking and cybersecurity.

100% of the students agreed that the Cisco Packet Tracer helped them understand a real-life situation through a simulation, and 87% of the students are most likely to recommend the tool as good practice for their colleagues and friends.

**The number of female students attended these workshops:**



Above are the graphs of gender breakdown of attendees for the two networking and cybersecurity workshops (65% and 67% of female attendees, respectively)

For the Robotics and Web Development Workshops, before and after surveys were conducted. 17 participants took the survey where 16 of them were female, 1 was male students. Participants were asked the same 10-point scale question before and after the workshops: “Do you feel enthusiasm for computer science?” where 0 indicates “not at all” and 10 indicates “definitely yes”. The results are calculated as Net Promoter Score ( $NPS = \text{total \% of promoters} - \text{total \% of detractors}$ ). In the before survey the NPS was -15 and after it increased to 23. Also, the average of



the answers were increased from 6.84 to 7.53. The participants were asked if they already had any prior knowledge about the topic of the workshop and 100% of the participants answered as “no”. As mentioned earlier, most of the workshops were designed and conducted by our students, mostly female students. Two of our girls, Ilma and Fahira gave their feedback on their experience in “We, GEN Z Girls in IT”:



*“Participating as facilitators in the cybersecurity and Arduino workshops aimed at promoting gender equality in IT has been an incredibly rewarding experience for us as computer science students. Witnessing the impact of these activities on the girls who attended was inspiring. We saw their confidence grow as they actively engaged with the subject matter, overcoming initial reservations and stereotypes. It was evident that the workshops created a supportive and inclusive environment where everyone felt empowered to explore and excel in the STEM world. Seeing the girls' enthusiasm and passion for technology ignited a sense of fulfillment within us, knowing that we played a small role in breaking down barriers and fostering gender equality in the field. The workshops served as a reminder of the transformative power of education and the importance of creating opportunities for underrepresented groups, ultimately shaping a more diverse and inclusive future in IT.”* – **Ilma Kliko and Fahira Delalic**, Graduates of International University of Sarajevo, Sarajevo ACM-W chapter, and active members of the “We, GEN Z Girls in IT” initiative at IUS.

First IUS student participation in womENCourage conference was realized by our student Denis. He has shared his experiences during his time as part of “We, GEN Z Girls in IT”.



*“As a male computer science student, my participation in the womENCourage conference held in Cyprus in September 2023 was crucial in promoting gender equality and encouraging girls to pursue careers in STEM. By attending and actively engaging in the conference, I showcased my commitment to inclusivity and demonstrated that the fight for gender equality is not solely the responsibility of women. My presence served as a powerful statement, emphasizing that men have a role to play in breaking down barriers and supporting the participation of women in STEM fields. By standing alongside my female peers*

*and actively promoting a diverse and inclusive environment, I helped foster a sense of belonging and empowerment for girls attending the conference. Together, we can work towards creating a future where opportunities in STEM are accessible to everyone, regardless of their gender.”* Denis Suljaković, Graduate of International University of Sarajevo, Sarajevo ACM-W chapter, and active member of the "We, GEN Z Girls in IT" initiative at IUS.