



NTNU – Trondheim
Norwegian University of
Science and Technology

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Gender Issues in Computer Science Research, Education, and Society



<https://www.ntnu.edu/employees/letizia.jaccheri>

About ACM



- ACM, the Association for Computing Machinery (www.acm.org), is the premier global community of computing professionals and students with nearly 100,000 members in more than 170 countries interacting with more than 2 million computing professionals worldwide.
- OUR MISSION: We help computing professionals to be their best and most creative. We connect them to their peers, to what the latest developments, and inspire them to advance the profession and make a positive impact on society.
- OUR VISION: We see a world where computing helps solve tomorrow's problems – where we use our knowledge and skills to advance the computing profession and make a positive social impact throughout the world.
- I am proud to be an ACM Member.

The Distinguished Speakers Program is made possible by



**Association for
Computing Machinery**

Advancing Computing as a Science & Profession

For additional information, please visit <http://dsp.acm.org/>

Trondheim

Pisa





My role models



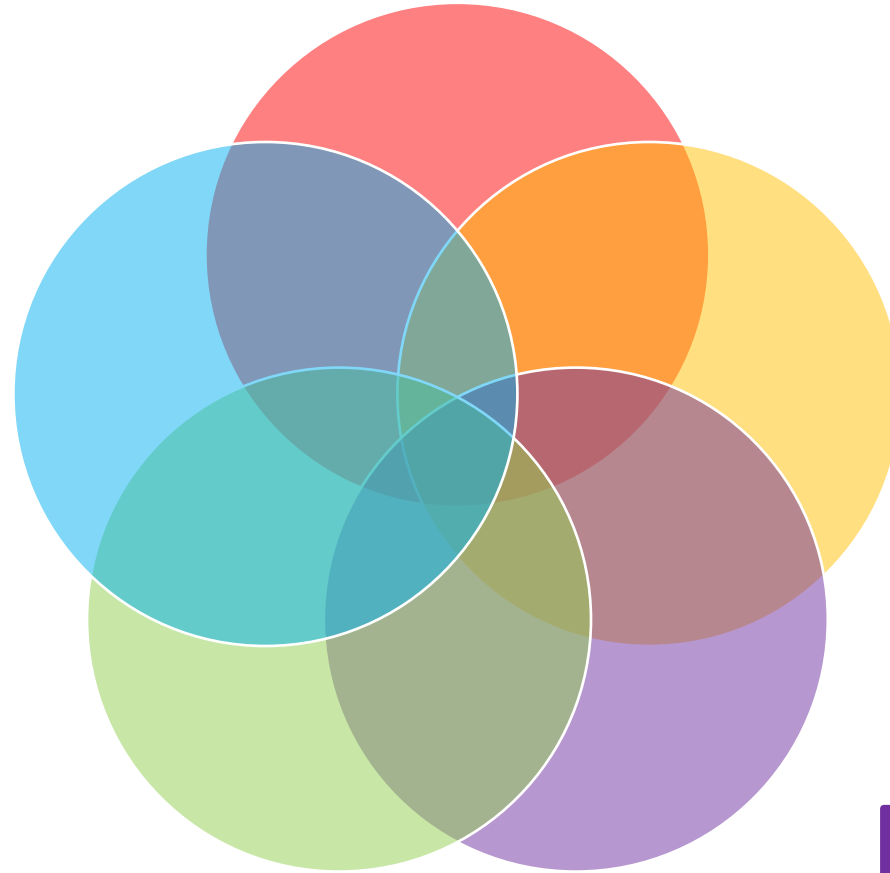
Gender

Network,
Resources

Research

Projects

Education



UN Goal 5:

Achieve **gender equality** and empower all **women** and girls. Ending all discrimination against **women** and girls is not only a basic human right, it's crucial for sustainable future; it's proven that empowering **women** and girls helps economic growth and development.



5 GENDER
EQUALITY



Software engineering and gender

- People decide requirements
- People develop solutions for people
- People Interact with systems

Software engineering and gender

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- People develop solutions for people
- People Interact with systems

Question: who decides the requirements and for which people?

Designing Software to Prevent Child Marriage Globally, J Brevik, L Jaccheri, JCT Vidal, Proceedings of the 18th ACM International



Technology with gender biases

- From smartphone voice assistants (Microsoft's Cortana, Apple's Siri, Amazon's Alexa) that are all female with noticeable submissive personalities and ill-equipped to respond to user requests regarding crises that predominantly affect women (e.g., sexual assault)
- [I'd blush if I could, UNESCO/EQUALS Global, 2019]

Should we convert it into a RQ?

Technology with gender biases



ACTIVITY TRACKERS THAT FAIL TO
MEASURE STEPS IN THE,
PREDOMINANTLY FEMALE, ACTIVITY
OF PUSHING A STROLLER.



TRANSPORT NETWORKS THAT
IGNORE THE SO-CALLED “MOBILITY
OF CARE”



AI RECRUITING TECHNOLOGY
DEVELOPED TRAINED
PREDOMINANTLY ON MEN’S
RÉSUMÉS



EU REPORT OF THE EXPERT GROUP
“INNOVATION THROUGH GENDER”

Europe Bachelor, Master, PhD

At the Bachelor level 80% or more of the students enrolling or graduating in Informatics Bachelor programs are male.

At the Master level 80% of the Master graduates in Austria, Belgium, Czech Republic, Germany, Italy, Lithuania, the Netherlands, Poland, Portugal, Spain, Switzerland are male

At the Ph.D. level, except for Bulgaria, Romania, Estonia, Turkey, all other countries have less than 25% of women graduating from Informatics Ph.D. programs

Software engineering and AI

People

- Decide requirements
- Develop solutions for people
- Interact with systems



腾讯
Tencent

Computer system

- learns

big data

2018 *This Is What Happens In An Internet Minute*



Question: who decides how the system will learn?

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Scarcity of role models

Engineering and Technology: on average, in the whole of Europe, women take less than 15% of the full professor positions

Figures show that in 2016, an overwhelming majority (83.3%) of ICT specialists employed in the EU were men.

Skills and talent gap: 53% of European employers say they face difficulties in finding the right people with the right qualifications.

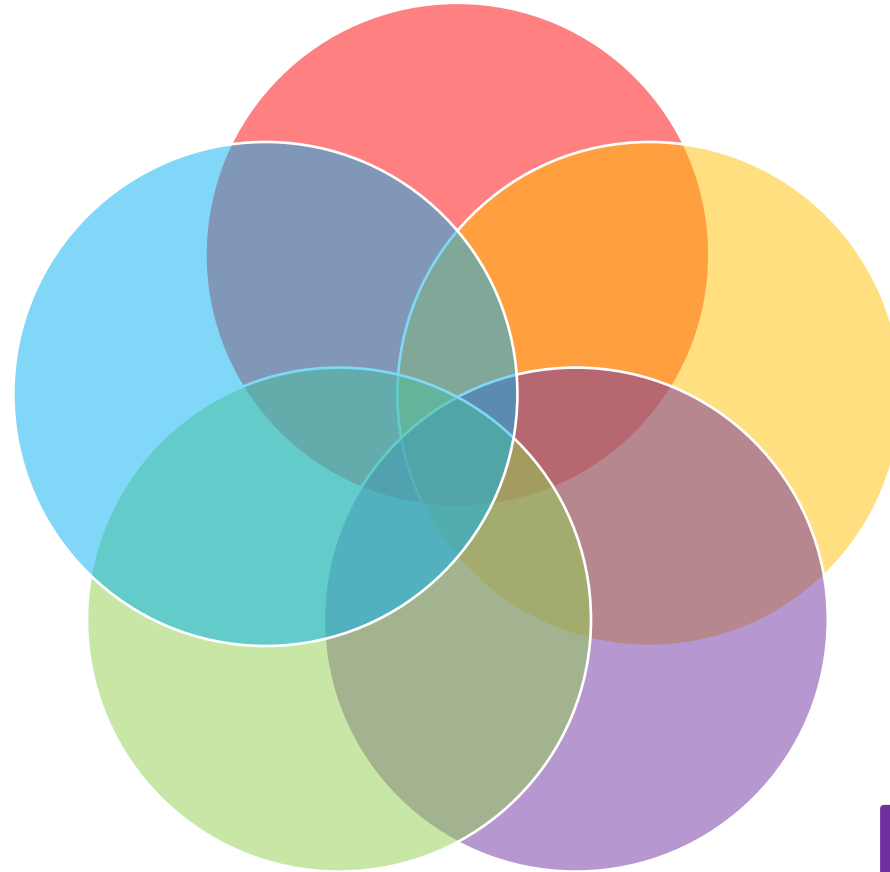
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Girl project ADA

2004	2019
7%	36%

Average %-share 5-year integrated Master

- Computer Sciences
- Communication Technologies
- Cybernetics and Robotics
- Electronics System design and innovation

www.ntnu.edu/girls



- Calling the applicants
- Welcome day
- 8th March - Women's Day
- Networking lunches
- Programming courses
- Mountain hiking
- CodeHubs
- PhD-party
- Invite girls from high school from all over the country
- 3 days
- Presentations and workshops
- Personal meeting with rolemodels
- Meeting students
- Break down stereotypes
- Hands-on experiences



IDUN – from PhD to Professor

1 Mio. Euro 2019 – 2022

Background:

581 employees in scientific positions – 22% female

125 professors – 13,8% female

Challenge:

- Too few women at master level
- Dropout from phd to professor

<https://www.ntnu.edu/idun>



IDUN

From PhD to professor

NTNU



Idun Reiten, the first female professor at the Faculty of Information Technology and Electrical Engineering, Norwegian University of Science and Technology (NTNU)



IDUN

First FUTURE-ORIENTED
CENTER

The Research Council
of Norway

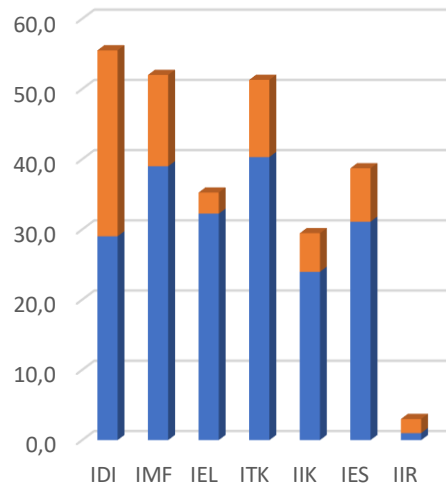


NTNU

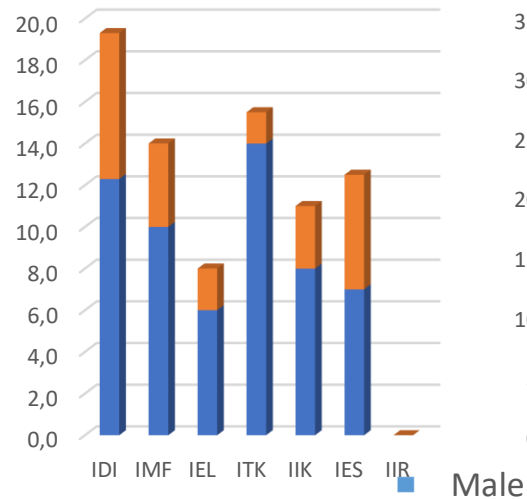
Faculty of Information Technology
and Electrical Engineering

Gender balance at the IE faculty

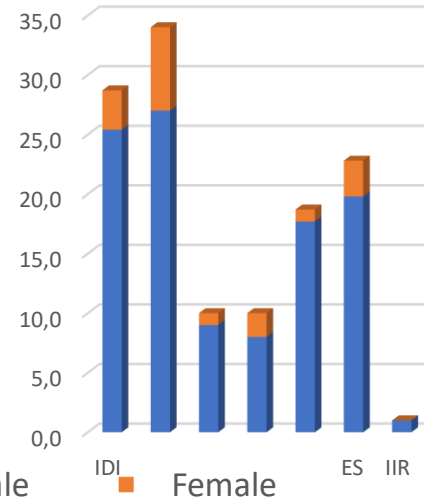
PhD Candidates



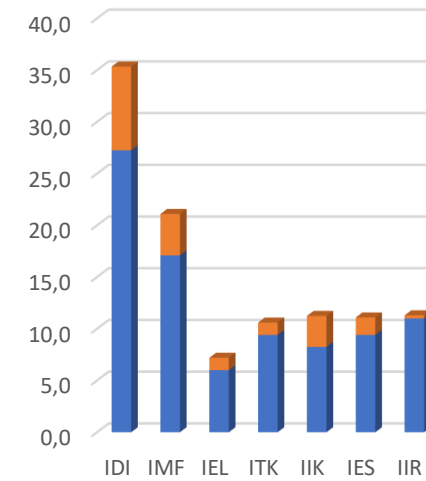
Postdoctors



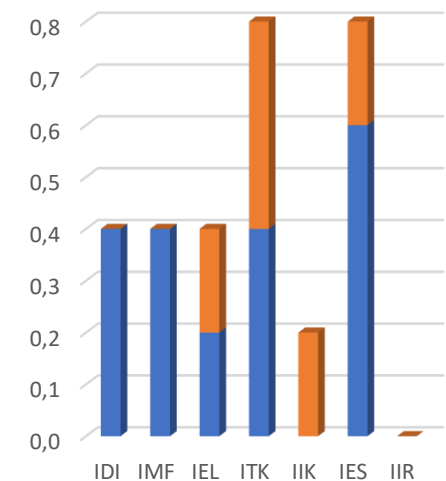
Professors



Associated professors

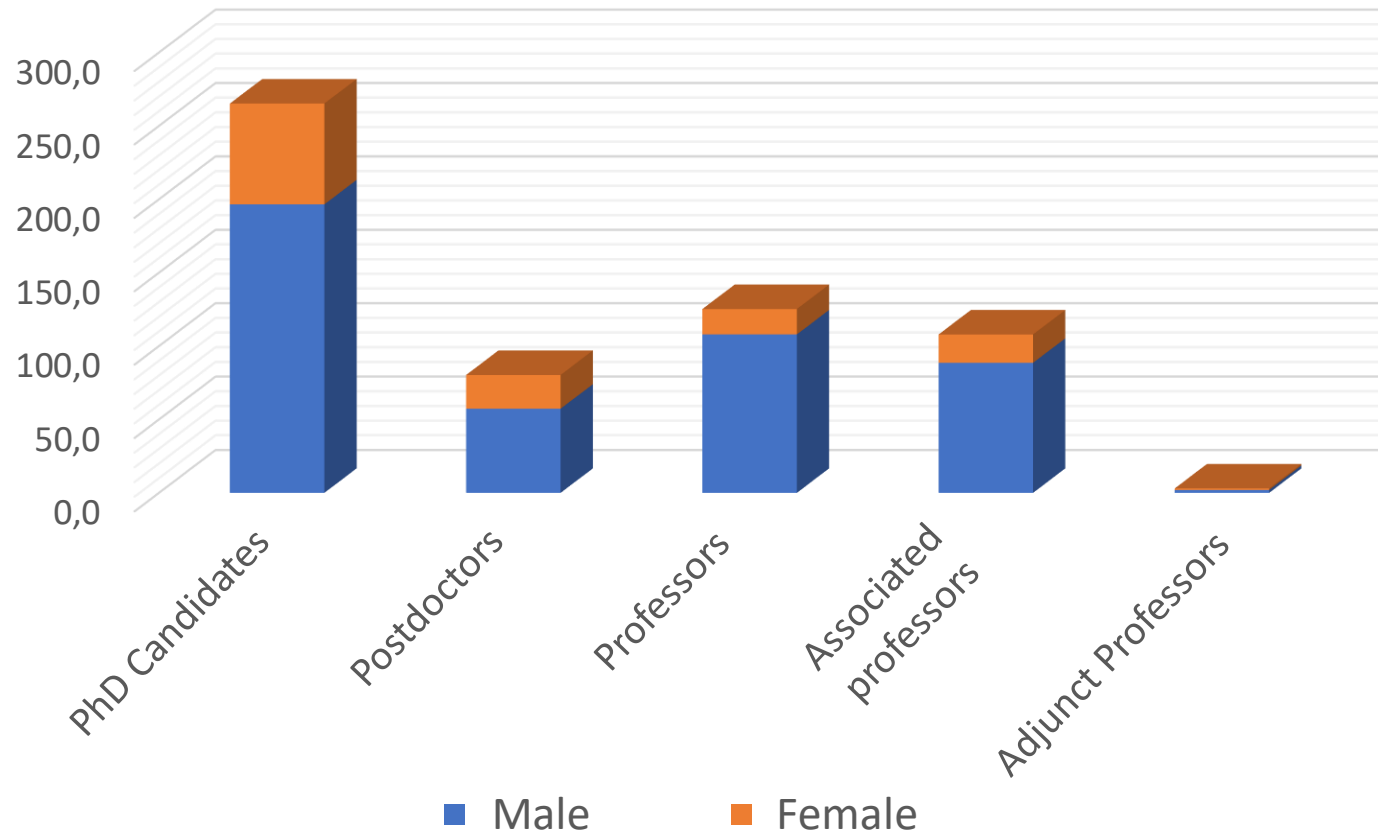


Adjunct Professors

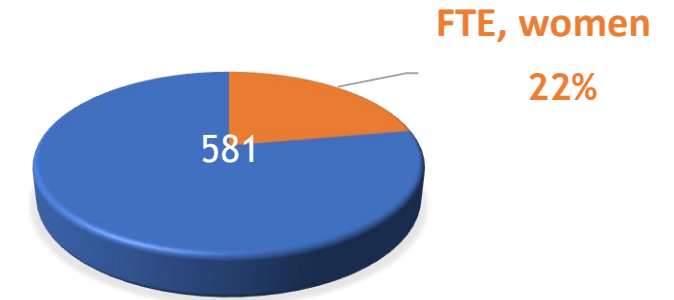


Why IDUN?

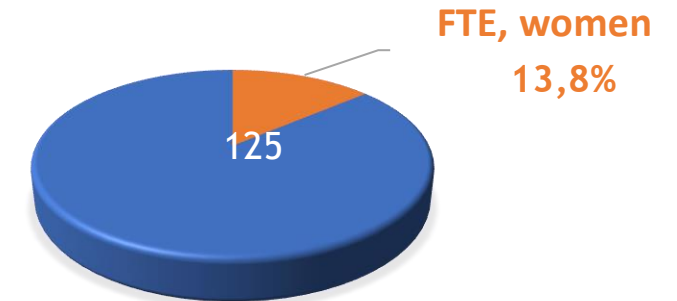
SCIENTIFIC PERSONNEL AT IE FACULTY



SCIENTIFIC PERSONNEL



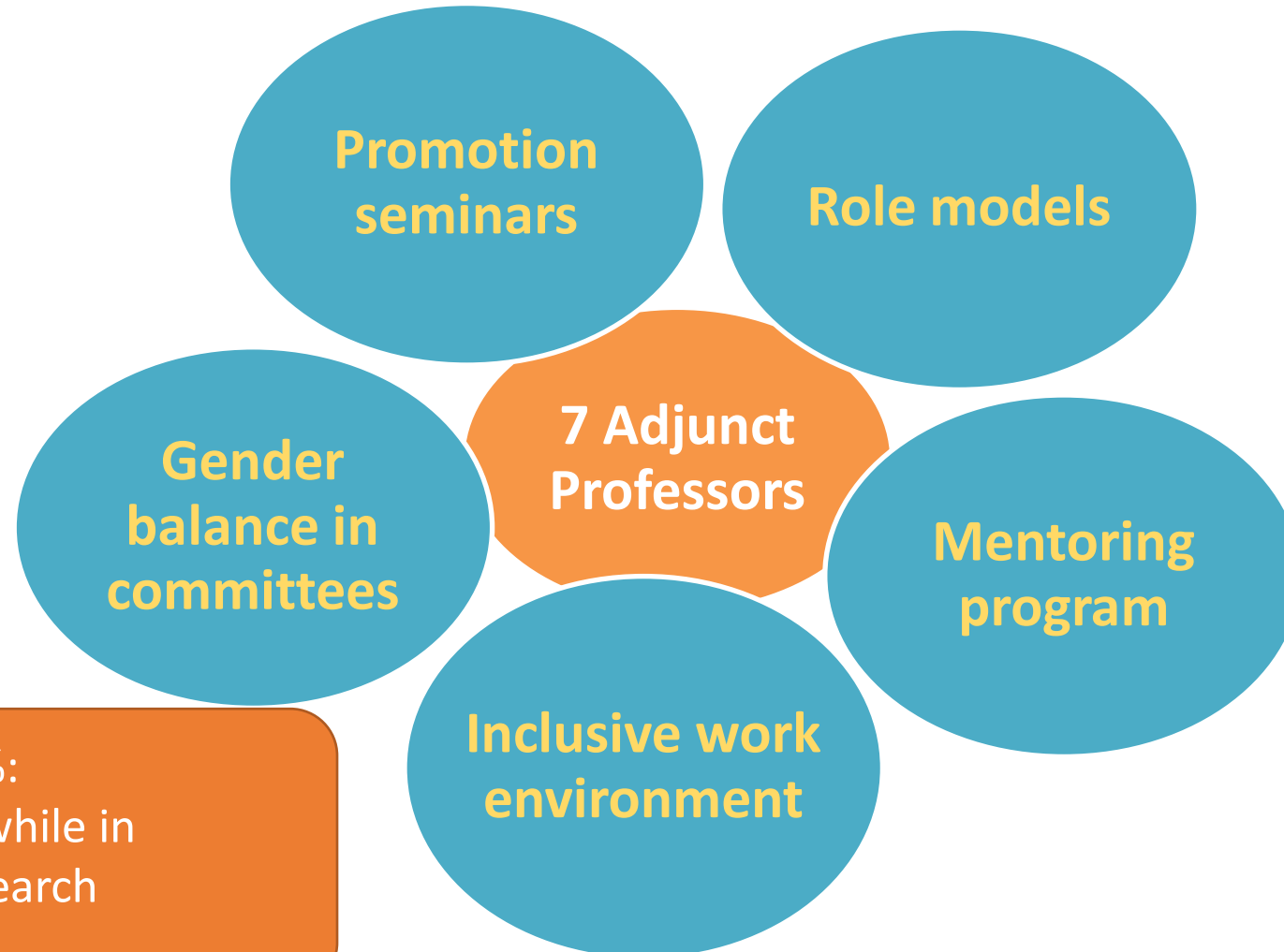
PROFESSORS



IDUN Scientific Mentoring Program & beyond



IDUN
From PhD to professor
■ NTNU



A professor working 20%:
usually teaching duties while in
IDUN the focus is on research
and mentoring

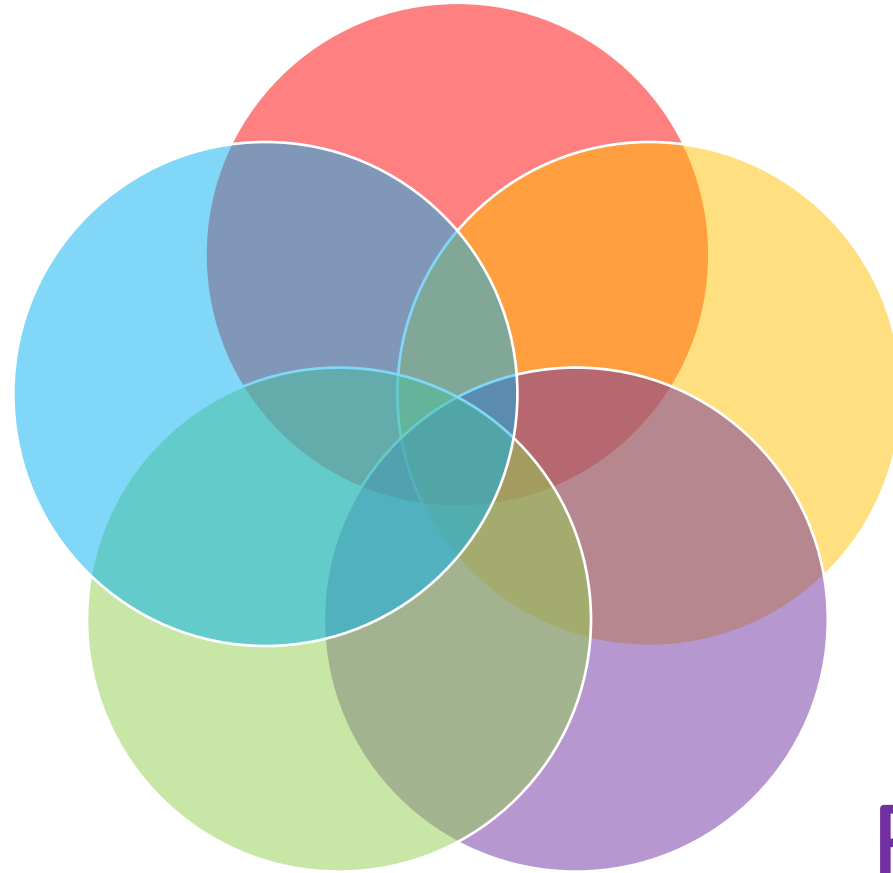
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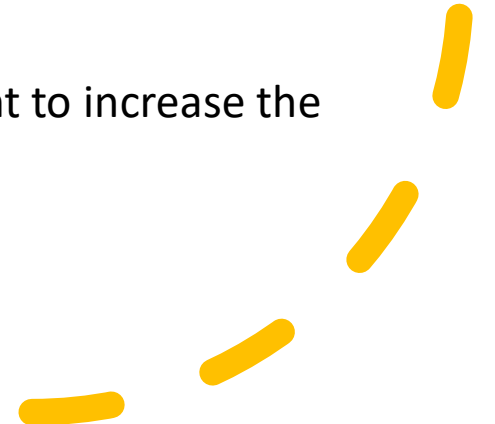


ACM Women Chapter



- Why Should You Start an ACM-W Chapter at Your School?
- “101 Ideas for ACM-W Chapters”
- Activities to educate women about the opportunities in the computing field
- Engage women students in exciting computing activities;
- Connect students with women leaders in the field;
- Encourage students to promote the field of computing to young girls;
- Promote the activities of ACM
- Network with other ACM-W Chapter leaders and members
- Mentor chapter members and pre-college girls
- Broaden the computing community
- Extend the “conversation” about why it’s important to increase the number of women in computing

<https://women.acm.org/chapter/>



COST Action 19122

- European Network For Gender Balance in Informatics (EUGAIN)
- 37 member countries and Kosovo
- Albania, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Lithuania, Luxembourg, Malta, Moldova, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom



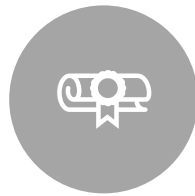
The main challenges addressed

- How to have more girls choosing Informatics as their higher education studies and profession.
- How to retain female students and assure they finish their studies and start successful careers in the field.
- How to encourage more female Ph.D. and postdoctoral researchers to remain in the academic career and apply for professorships in Informatics departments.
- How to support and inspire young women in their careers and help them to overcome the main hurdles that prevent women to reach senior positions in the field.
- How to leverage from the experience of the partners in the network to tackle the previous challenges and achieve progress across more institutions and countries, and positive results that are sustained on the longer term.
- How to do science

COST ACTION



**WG1: From School
to University**



**WG2: From
Bachelor/Master
Studies to Ph.D.**



**WG3: From Ph.D. to
Professor**



**WG4: Cooperation
with Industry and
Society**



**WG5: Strategy &
Dissemination**



- Conferences

- Grace Hopper Celebration. <https://ghc.anitab.org>
- ACM ACM Celebration of Women in Computing womENcourage (Rome 2019)
- <http://ieee-wie-ilc.org/>
- womENcourage (Rome 2019)



- Projects at Universities

- The Girl Ada Project. <https://www.ntnu.edu/girls>
- CS4All initiative, School of Computing, TU Dublin, www.dit.ie/computing/studentresources
- Irène Curie Fellowship at TU Eindhoven. <https://www.tue.nl/en/working-at-tue/scientific-staff/irene-curie-fellowship>
- Gender Initiative Chalmers <https://www.chalmers.se/en/about-chalmers/Chalmers-for-a-sustainable-future/initiatives-for-gender-equality/gender-initiative-for-excellence/Pages/default.aspx>
- EQUAL-IST Project. <https://equal-ist.eu>
- IDUN project at NTNU. <https://www.ntnu.edu/idun>



- Policy Documents and white papers

- Women in Digital. Digital Single Market Policy. <https://ec.europa.eu/digital-single-market/en/women-ict>
- <https://unesdoc.unesco.org/ark:/48223/pf0000367416>
- EU Report of the Expert Group “Innovation through Gender” <https://op.europa.eu/en/publication-detail/-/publication/d15a85d6-cd2d-4fbc-b998-42e53a73a449>
- SHE Figures https://ec.europa.eu/info/publications/she-figures-2018_en
- ELSEVIER The researcher journey ... <https://www.elsevier.com/research-intelligence/resource-library/gender-report-2020>
- Informatics Europe Report on Informatics Education in Europe <https://www.informatics-europe.org/publications.html>



- International Networks

- Informatics Europe WIRE <https://www.informatics-europe.org/working-groups/women-in-icst-research-and-education.html>
- ACM Women in Computing Europe. <https://europe.acm.org/acm-we>
- European Centre for Women and Technology. <http://www.ecwt.eu>
- CEPIS Women in ICT Task Force. <https://www.cepis.org/index.jsp?p=1142&n=2909>

Thanks to

- The whole EUGAIN and IDUN project participants
- This work has been partially supported by the COST Action CA19122 - European Network for Gender Balance in Informatics and by NFR 295920 IDUN.
- Jaccheri L, Pereira C, Fast S. Gender Issues in Computer Science: Lessons Learnt and Reflections for the Future. In 2020 22nd International Symposium on Symbolic and Numeric Algorithms for Scientific Computing (SYNASC) 2020 Sep 1 (pp. 9-16). IEEE.
- <https://youtu.be/V7hzX9UgWel> youtube Jaccheri gender