

## **Application of the Women in MIR-initiative for the MINERVA Informatics Equality Award 2018**

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**Motivation.** The Department of Information and Computing Sciences at Utrecht University applies for the MINERVA Informatics Equality Award 2018 on behalf of the international Women in Music Information Retrieval (WiMIR) initiative, which offers a mentoring program and travel grants to self-identified women in the Music Information Retrieval (MIR) field. MIR constitutes a subfield of Computer Science, dedicated to processing, analysing, organising and accessing music information. Anja Volk, assistant professor at our institute, co-founded the mentoring program, now in its third year. The program attracts female high-school, bachelor, master, and PhD students from STEM fields, to get to know the rapidly growing research field of MIR through dedicated international MIR mentors. WiMIR travel grants allow women to attend the main conference in this field (ISMIR conference). In 2018, the first-ever WiMIR workshop will be held to showcase technical work of women in MIR. In 2019, the ISMIR conference will take place in the Netherlands. Should the initiative receive the MINERVA award, the grant money will be spent in coordination with the ISMIR board and the ISMIR 2019 organizers for attracting female students to the conference (please find support letters from both organizations attached). This way, the local efforts of the newly established WICS group (Women in Information and Computing Science) at Utrecht University on reaching out to high schools in order to attract female students to computer science, will receive a considerable boost through the ISMIR conference in the Netherlands in 2019. Hence, the international WiMIR initiative and the activities of the local WICS network for attracting female students to computer science will reinforce each other through the award money.

**Public summary.** The Women in Music Information Retrieval initiative offers a mentoring program, travel grants, and technical workshop to women in MIR, a subfield of Computer Science. These initiatives expose female high-school, bachelor, master, and PhD students to the rapidly growing research field of MIR through dedicated international mentors and attendance at the yearly main MIR conference (ISMIR). Since 2016, the number of participants in the mentoring program has quadrupled, while 40% of all female attendants of the ISMIR conference in 2017 have been supported by a travel grant, over half of whom were attending the conference for the first time.

**Note:** The nomination can be considered as a runner up (if it does not win the award) and be included as an exemplar of best practice in future Informatics Europe publications.

## Description of the Initiative

The international Women in Music Information Retrieval (WiMIR) mentoring program and travel grants initiatives began in 2016, after many years of regular meetings of WiMIR (founded in 2011). The WiMIR group is dedicated to promoting the role of, and increasing opportunities for, women in the MIR field. The WiMIR mentoring program connects self-identified women students, postdocs, early-stage researchers, industry employees, and faculty to more senior women and men in MIR. The program encourages and supports women in pursuing a career in MIR, raises awareness on issues often faced by women in the field, and establishes networks between different generations, genders, geographies, and disciplines within MIR in academia and industry. WiMIR travel grants, which are funded by sponsor contributions, have since 2016 facilitated attendance at the yearly ISMIR conference for women in the field. These travel grants not only allow more women to attend the conference, but also provide opportunities for the MIR community to learn more about the challenges and benefits of fostering a diverse community, for instance through the sponsor-funded guest speaker during the 2017 WiMIR plenary session, and a WiMIR reception included in the main conference program. For the first time in 2018, a one-day WiMIR workshop will be held as a satellite event of the ISMIR conference. This event will highlight technical work of women in the field, and provide additional opportunities for networking, mentorship, and development of research ideas among the attendees.

The WiMIR mentoring program, travel grants, and workshop provide mutual enforcing instruments for **recruiting and supporting female students in the MIR field**, a subfield in Computer Science. The **WiMIR mentoring program** is organized on a yearly basis: the program committee sends out announcements of subscriptions to the program to both mentees and mentors through email lists, and then matches mentees and mentors based on a number of criteria and preferences. In the introductory email sent out to each mentor and mentee pair, advice and ideas are provided on how to start the mentoring in the first session; separately, mentors receive tips on how to be a good mentor. All guidelines have been adapted from a mentoring program for women at Utrecht University. The mentor-mentee matches then allocate 4 remote meetings within a 6-month period.

The virtual nature of the sessions enables this program to reach geographical regions in which the field of MIR is hardly established, such as South America, and helps women to connect to the MIR community. Since its inception in 2016 with 22 mentoring pairs, participation has roughly doubled each year, with 49 mentor-mentee pairs in 2017, and 81 pairs in 2018, coming from Europe, North and South America, Asia, Australia, and New Zealand. According to our surveys, the most important topics discussed in the mentoring sessions are “Career paths in academia”, “Career paths in industry”, “Work/life balance”, “Graduate school”, “Dealing with sexism”, and “Balancing career with family/children”. All of these topics are **crucial for female students to enter an academic program in computer science and to envision a career following this program**. Two thirds of the mentors work in academia, and one third in industry. This allows mentees to discuss future carrier options in both fields. Many mentees have signed up more than once in consecutive years, allowing them to switch between academic and industry mentors. Motivations from mentees to sign up reach from general inquiries about the field on how to combine their interests in computer science and music, to specific requests on advice regarding internships, specific projects, advice on possible PhD programs, or help for grant proposal writing. Accordingly, in the feedback we collect after each mentoring round, we receive positive comments regarding the opportunity to discuss career perspectives during mentoring sessions, such as *“My mentor helped me understand the different career paths in industry and academia. He also helped me take initial steps to explore my interest in the MIR field further”, “It has been brilliant to discuss openly and freely, and to try to look for a long-term perspective”, “In my country there are not many people working in MIR and it is motivating to be in touch with members of the MIR community from other places, specifically with experienced people who can talk to you about different scenarios”, and “The gender disproportionality somehow to me brings fear of not choosing a secure career option. The mentorship program has been a confidence booster to me.”*

The **WiMIR travel grants** complement the remote nature of the mentoring program by enabling women to attend the yearly ISMIR conference and to meet their mentors, other mentees, and the wider MIR community: *“As a high school student, I submitted a late-breaking paper to ISMIR with no expectations, so receiving the WiMIR grant was beyond exciting and gave me so much encouragement to keep pursuing my research.”, “I am so grateful to have had the opportunity of attending ISMIR for the first time thanks to the WiMIR travel award. Throughout my undergraduate experience, I sought ways to*

*connect my electrical engineering education to my passion for music but had a hard time finding a community that sought to do the same. ISMIR has given me the chance to turn my curiosities into real research.*” WiMIR travel grants are especially important for **attracting new and prospective students to the MIR field**, as they are eligible for Late-Breaking-Demo submissions, not requiring the main presentation format of a full peer-reviewed paper, which can be difficult to achieve for students who are not already involved in MIR.

Since 2016 each ISMIR organizing committee includes an ISMIR-WiMIR committee, responsible for organizing a **plenary WiMIR session** at the conference and advising and encouraging the conference organizers on including female members of the community in all aspects of the conference (e.g. keynote speakers and session chairs). This way, students coming to the conference **witness the presence of female role models**, which we consider an important aspect of encouraging women to pursue a career in computer science/informatics: *“To many of us, ISMIR is the most friendly and inspiring conference, which is certainly related to the diversity of attendees, in terms of disciplines, research topics, place of origins, levels of study/experience, gender, etc. It is essential to keep this merit of ISMIR in the future, so that we can continue attracting and retaining precious talent in MIR.”* (WiMIR travel grant recipient in 2017). **Creating such an inclusive atmosphere** has required the combined efforts of the WiMIR group, the ISMIR board and organizers of ISMIR conferences over several years. The first-ever plenary WiMIR session took place at ISMIR 2015, after many years of informal gatherings of the WiMIR-group outside the official conference program. In this plenary session, both academic and industrial participants shared their concerns on how **difficult it is to recruit women in MIR**, identifying the need for **combining both local efforts on attracting high-school students** to universities, and **global efforts to retain them in computer science career paths** by providing access to an international network of potential academic and industrial employers. Moreover, we discussed in this plenary session the potential benefits of a mentoring program for this field to attract more women, and the importance of actively seeking for specific travel grants for women to attend the yearly ISMIR conferences. Both ideas have been implemented for the first time in 2016, while we opened the [Women in MIR blog](#) publicizing our activities on increasing diversity and inclusion in MIR in the same year. On this blog, we maintain a [public list of women in Music Information Retrieval](#), assisting the search for female keynote speakers, invited speakers, reviewers, and conference committee members, as well as identifying female role models in the field.

The **WiMIR workshop** is jointly organized by WiMIR and an industry sponsor, and will take place for the first time in 2018 as a satellite event of the ISMIR conference. This event will include a poster session, networking lunch, and small-group prototyping sessions mentored by senior women and allies in the WiMIR community. The aims of this event are to further extend the networking opportunities of the main ISMIR conference, highlight technical work of women in the field, and focus on possible research topics that could continue as collaborations after the event. Thus, especially for women who are not currently affiliated with an MIR research group, the event will provide a valuable opportunity to establish longer-term connections that extend beyond mentorship into technical collaborations.

In sum, we consider it a **specific strength of the WiMIR initiative to tie local efforts of computer science departments** at universities to attract high school students, to the **activities of an international network** of researchers in academia and industry on opening exciting career options to women, and hence retaining them in computer science.

**How will the money be spent?** Should we receive the MINERVA Equality Award, the award money will be spent to attract female students to the ISMIR 2019 conference, taking place in the Netherlands. As we have learned in our surveys, the field of Music Information Retrieval is often hardly known to the younger generation, yet it provides for many of them an excellent opportunity to combine their interest in Informatics/Computer Science with their love for music. The conference can therefore provide an excellent platform to attract students already at the high school level. The newly founded WICS group (Women in Information and Computing Science) at Utrecht University is in the process of setting up an outreach program to high schools in the Netherlands, which will provide a platform to disseminate the WiMIR activities and information on the conference in 2019 to local students. In collaboration with the ISMIR organizers in Delft, we plan to develop international workshop material to be taken to schools before the conference. Hence, the **award would boost our local and global activities to attract women to study computer science and to retain them in computer science careers** by giving them access to an international network of MIR researchers in both academia and industry opening up future career options.

## Evidence of impact

The impact of the WiMIR initiative becomes most evident through the **increase of participants in the mentoring program between 2016 and 2018**. In our inaugural year, we piloted the program with 22 mentoring pairs. Our academic mentors hailed from some of the most prestigious universities, and the number of unique universities with a mentor in the program has grown from 20 in our first year to over 60 in our 3rd and current year. Similarly, on the industry side, our first year saw industry mentors from only Google and Pandora. That list of institutions has only grown, and now we are proud to say that we have mentors from most of the leading music technology companies, including Google, Pandora, SoundCloud, Universal Music Group, Spotify, Sony CSL, Deezer, Microsoft, Shazam, Smule, Native Instruments, and even AI and music startups such as Jukedeck and Melodrive. Mentors and mentees in 2018 reside in Europe, North and South America, Asia, Australia and New Zealand.

Year	2016	2017	2018
Number of mentoring pairs	22	49	81

The rough **quadruplication of participants** from 22 mentoring pairs in 2016 to 81 pairs in 2018 demonstrates how positively this initiative has been received by both mentors and mentees, as well as the strong need for such a program, which offers students the opportunities to discuss future career options in both academia and industry. According to our sign ups, many participants learned about the initiative via recommendation from others, showing that the program is highly valued and recommended. The majority of mentees are students and some also choose to act as mentors for other students, which further enlarges the network of female students to more senior members of the research community. The program has inspired the Mentoring program at Universitat Pompeu Fabra, Barcelona, which reused some of our material. Anja Volk was invited to speak about the mentoring program at ACM Multimedia 2016, allowing the initiative to reach related research communities and giving an example on increasing career chances for women in Computer Science/Informatics. As **evidence of the program's impact on individual students** who have participated, we attach a number of testimonials that we have received from participants in the feedback rounds. They show how the program offers students the opportunity to get to know the field of MIR and to discuss future scenarios of career options, which are both important **for recruiting and supporting female students**:

*"Having an exchange with people strongly involved in MIR is a great help for someone like me who is starting in the field and is full of doubts."*

*"It has been brilliant to discuss openly and freely, and to try to look for a long-term perspective."*

*"It is great to get an outsider perspective on your career and opportunities."*

*"My mentor holds an important job at a leading MIR-related company ... The advice that he gave me about choosing a summer internship was very helpful and I'm confident that I made the right choice because of him."*

*"I saw possibilities and perspectives of people who 'know better' about that world in which I'm moving towards to but not quite there."*

*"In my country there are not many people working in MIR and it is motivating to be in touch with members of the MIR community from other places, specially with experienced people who can talk to you about different scenarios"*

*"It was a great program and it helped me get a more complete picture of the life after the PhD."*

The **comments of mentors** on what motivates them to participate in the program demonstrates that the initiative is also important for those who are seeking to **attract female students to universities**: *"To meet female promising researchers in my area, to increase the number of female students in my group."*, *"Better understanding of challenges faced by women like my mentee. Very rewarding"*, *"To*

create diversity in our community”, “It has helped me develop a much broader perspective on gender issues and challenges in academia.”

For more detailed information on the impact of the mentoring program on participants, we refer to our blogpost [WiMIR Mentoring Program Report 2017: the many faces of diversity](#) and to the [WiMIR Mentoring 2017 Gratitude Wall](#).

The WiMIR initiative started to keep **statistics on the number of females attending the ISMIR conference**, as well as **their representation in the conference** through keynotes, oral presentations, and session chairs in 2015. Since then, we present these statistics in the yearly plenary WiMIR sessions at ISMIR and encourage ISMIR organizers to consider diversity at the conference:

	<b>Accepted 1st authors</b> (females/total)	<b>Attendees</b> (females/total)	<b>Oral presentations</b> (females/total)	<b>Keynotes</b> (females/total)	<b>Session chairs</b> (females/total)
2015	Missing data	Missing data	3/20 (15%)	0/2 (0%)	1/8 (13%)
2016	15/113 (13%)	44/342 (13%)	4/25 (16%)	2/2 (100%)	4/7 (57%)
2017	17/97 (18%)	57/282 (20%)	5/24 (21%)	1/3 (33%)	7/15 (47%)
2018	19/105 (18%)	Unknown yet	No distinction poster/oral	1/2 (50%)	11/21 (52%)

We observe a general trend of **increase in the ratios of accepted female 1st authors, female attendees, and session chairs after 2015**. While we had **no female keynote speakers** at ISMIR conferences 2011-2015, this has changed since 2016. Hence, female students coming to the conference have now a better chance to **witness female role models** and to experience diversity at the conference. As of this year, Emilia Gómez heads the ISMIR board as the first-ever female president of the society. ISMIR 2017 took place in China, a country that is rather remote to most MIR researchers (the majority of labs is located in Europe and North America) - we consider the fact that **20% of all attendees were female as a great success of the WiMIR travel grants**. 40% of all female attendants of the ISMIR conference in 2017 have been supported by a travel grant, over half of whom attended the conference for the first time. The grants allow female students to meet the community, to acquire a wide overview on the field, and to present their own work. In the following we add a number of testimonials from travel grant awardees, showing how the conference inspired them to **enter the field and to continue a career in the future**:

*As a **high school student**, I submitted a late-breaking paper to ISMIR with no expectations, so receiving the WiMIR grant was beyond exciting and gave me so much encouragement to keep pursuing my research... I spoke with researchers from universities around the world and companies like Spotify, Pandora, and Smule; my conversations with people equally passionate about math, computer science, and music allowed me to learn about their projects and gain valuable feedback to expand on my own research. ... Coming from an all-girls school especially, I am super appreciative of the work WiMIR does to increase opportunities for women in STEM like me.*

*The conference gave me the opportunity to immerse myself in a community of people who are clearly passionate about both music and the technologies that help advance our understanding of it. I am currently applying for PhD programs, and this travel award has helped me **confirm that MIR research is the direction in which I want to head**.*

*Thank you to the ISMIR 2017 WiMIR travel award sponsors so much for having me, an **undergraduate student**, joining in the top international conference in MIR. I really enjoyed my time there and was excited to learn about so many inspiring projects and ideas. I look forward to next year's conference in Paris!*

In sum, the **different WiMIR activities have helped to attract young female students to the field**, by giving them opportunities to discuss future career plans, getting to know the community at the yearly ISMIR conferences, increasing their network, and experiencing an inclusive atmosphere with many female role models at the conference.

## Reference list

For additional information on the Women in MIR - initiative, we refer to the Women in MIR blog, describing our activities: <https://wimir.wordpress.com/>

In the following, we highlight a number of blog posts:

- **General information** on the mentoring program: <https://wimir.wordpress.com/mentoring-program/>
- Blog post of **master student** Magdalena Fuentes on how the WiMIR mentoring program helped her to get involved with the field of Music Information Retrieval: <https://bit.ly/2s0C2td>
- **WiMIR Mentoring Program Report 2017**: the many faces of diversity (blog post on summary and results of mentoring round in 2017): <https://bit.ly/2yuWS5i>
- **WiMIR Mentoring 2017 Gratitude Wall**: this blog post displays notions of mutual gratitude from participants of the WiMIR Mentoring Program in 2017: <https://bit.ly/2IDam8m>
- Blog post **introducing the WiMIR mentors 2017** from academia and industry: <https://bit.ly/2smX7OS>
- Blog post **introducing the WiMIR mentors 2018** from academia and industry: <https://bit.ly/2skFwae>
- Blog post on the WiMIR travel awards in 2017, with **testimonials of WiMIR travel award recipients**: <https://bit.ly/2J38QrZ>
- Blog post on ISMIR paper on **statistics regarding female and male authors 2000 - 2015**: <https://bit.ly/2IUPh9A>
- Blog post from mentor and WiMIR programm committee Ryan Groves on [Approaching Feminism as a Male Data Scientist](#)
- Slides summarizing the WiMIR mentoring program in 2016, presented at ISMIR 2016 in New York: [https://wimir.files.wordpress.com/2016/05/ismir2016\\_mentoringprogramm\\_info.pdf](https://wimir.files.wordpress.com/2016/05/ismir2016_mentoringprogramm_info.pdf)
- Slides summarizing the WiMIR mentoring program in 2017, presented at ISMIR 2017 in Suzhou: [https://wimir.files.wordpress.com/2017/11/wimir\\_ismir\\_mentoring2017web.pdf](https://wimir.files.wordpress.com/2017/11/wimir_ismir_mentoring2017web.pdf)