MARYLAND CENTER FOR WOMEN IN COMPUTING

2018-2019 Report

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Mission:

The Maryland Center for Women in Computing (MCWIC) works to increase diversity in all fields of computing by providing opportunities for individuals who identify as women to engage and contribute to the technical community through research, education, outreach, and partnerships. MCWIC envisions a vibrant community of scholars, researchers, students and others coming together to increase the involvement—and success—of all women interested in earning or currently pursuing a computing degree.

Goals:

- Supports, educates and mentors women majoring in computing fields at the University of Maryland
- Collaborates with the K-12 community in order to encourage all students, especially those from underrepresented populations to participate in computing
- Sustains a vibrant community of scholars, researchers, students and educators working together to increase the involvement—and success—of women interested in earning a computer science and other technical degrees
- Fosters a supportive, collaborative community for current undergraduate and graduate women studying computing at the university through a dedicated learning and meeting space

Staff:

Director: Dr. Jan Plane
Assistant Director: Kate Atchison
Coordinator (As of March 2019): Amy Andrade
Coordinator (As of March 2019): Morgan Lanahan
Graduate Coordinator: Jessica Brown
Graduate Coordinator: Samantha Ammons (2018)
Office Undergraduate Student Worker: Stacy George
Undergraduate Research Student: Elana Katzen
Other Undergraduate Student Staff: 15-18 Student Ambassadors per semester for outreach programs and 12 Tutors per semester

2018-2019 Executive Summary

Maryland Center for Women in Computing supported over 2500 K-12 students and over 750 current UMD students during the June 2018- May 2019 academic year.

- 35 outreach ambassadors supported ~33 activities that encourage students from underrepresented populations to pursue computing careers and interest serving over 2500 students over the last year.
- CompSciConnect summer camp hosted over 150 campers. The Cyber Defense Training Camp hosted 28 campers.
- After-school outreach programs expanded to include 5 Prince George's County Public Schools serving over 75 students each semester.
- A new Peer Mentoring program was launched serving over 60 students.
- Tech + Research launched in collaboration with Technica giving 64 undergraduate women from all over the east coast hands-on research experience with our faculty and graduate students.
- A Cyber Camp and CompSciConnect research poster was presented at the Tapia Celebration where our undergraduate research student won best poster.
- The MCWIC Tutoring program expanded to include all entry-level computer science courses. 16 tutors supported over 175 students that scheduled over 900 tutoring sessions in CMSC 131, 131A 132, 216, 250, 330, and 310 last academic year.
- 91 UMD students and 9 faculty and staff attended the Grace Hopper Celebration in Computing Conference.
- 2 new full-time staff members were hired in March 2019 to expand our programs and impact
- Additional funding was received from Brendan Iribe to expand our efforts and support all underrepresented populations in Computing. The Iribe Initiative for Inclusion and Diversity in Computing was officially launched in April 2019.

K-12 Outreach

K-12 outreach programs include CompSciConnect, after-school outreach programs, and weekend events.

Throughout the year, MCWIC Ambassadors take our curriculum on the road to visit local organizations and schools (i.e. local Girl Scout troops) with a fun STEM activity. Activities last approximately 2 hours. STEM options include LEGO Mindstorm Robots, cryptology activities and programming that provide an introduction to computing principles. Additional activities include high school recruiting events and local resource fairs.

Outreach efforts are primarily staffed by our MCWIC Ambassadors. Funding for these programs is supported primarily through Brendan Iribe, AFCEA Bethesda, and MCWIC general funds.

Key Stats:

- ~40 Outreach Events
- Over 2,500 students reached
- 35 undergraduate students hired to support programs

MCWIC Outreach Ambassadors

Each year, undergraduate students are selected to be MCWIC ambassadors where students receive training on best practices for teaching and content and then apply these skills to our various outreach programs described below. 15 Teaching Ambassadors are hired full-time in the summer to support camps. At least 10 Outreach Ambassadors are hired during the school year to support ~100 hours of events throughout the semester. From Summer 2018-May 2019, we had a total of 35 different ambassadors working for MCWIC.

CompSciConnect

Computer Science Connect is a three- year camp designed to introduce middle school girls and boys from underrepresented populations to programming concepts using robots, Scratch, dynamic web pages, and basic virtual reality. Campers also learn additional to computer science topics including number theory, cybersecurity, logic puzzles, and computer use and safety. CompSciConnect was started in the summer of 2012. Since its inception, 350 students have participated in CompSciConnect. Undergraduate students serve as Teaching Ambassadors by leading campers through the curriculum and supporting them with school year projects. In Summer 2018, six different two week sessions of camp were offered across six weeks. Over 200 students and their parents attended the annual showcase in December. During Maryland Day, we showcased projects as part of the Iribe Center for Computer Science and Engineering to donors and the community.

Key Statistics:

- 142 students in the summer camp
- ~100 students continuing each month during the school year
- 8 undergraduate Teaching Ambassadors
- 6 sessions of CompSciConnect across 6 weeks

MCWIC After-School Outreach

In a weekly after-school program, MCWIC Ambassadors provide after-school programs in nearby Prince George's County Public School System to introduce more students to computing through hands-on activities and real world problems. Much of the curriculum is adapted from CompSciConnect. In 2018, Greenbelt Middle School, Lamont Elementary, and College Park Academy continued their programs. Mother Jones Elementary and Langley Park Elementary were added in Fall 2018.

Key Stats:

- 5 PGCPS after-school outreach programs
- ~65 students served per semester
- 15 UMD undergraduate Outreach Ambassadors served 2-3 hours weekly each semester

High School Recruiting Workshop- Ladies Navigate Computer Science

In 2018, we hosted the Ladies Navigate Computer Science recruiting event to engage current high school juniors and seniors to learn about the University of Maryland Computer Science program, computing research, and computing careers. 40 high school women attended.

NCWIT Aspirations

The Maryland Center for Women in Computing serves on the NCWIT Maryland Affiliate Team. Each year we promote, recruit, review applications, and host the NCWIT Aspirations in Computing Award Ceremony to honor Maryland young women and their work in computing. In 2019, 105 students and educators were recognized for their efforts. The award ceremony was hosted at UMD in April with over 120 winners and their families present. Hands-on workshops around wearable technology and virtual reality were led by UMD undergraduate staff and members of the Maryland Affiliate Team. Additional outreach support is given through the Aspire IT grant program. We currently support high school student-run programs run by students at Montgomery Blair and Wootton High Schools. These programs support current high school girls to run after-school programs that teach computer programming.

Elementary Workshop- JumpStart Computing

In December 2018 and May 2019, we hosted the JumpStart Computing Elementary Workshop. Over 100 students participated in this program. During the workshop, students rotated between activities on Scratch, cryptography, number theory, and introductory Python Art. Outreach Ambassadors lead the curriculum. The Fall workshop was also part of the national Computer Science Education Week.

Girl Scouts

We partnered with the Girls Scouts of the Nation's Capital Region to host robotic workshops for Brownie and Junior Girl Scouts 1-2 times per semester. Two sessions of workshops are held each day with ~30 students served in each session. In 2018-2019, workshops were held in October 2018, November 2018, February 2019, and March 2019. 220 Girl Scouts in the local area were impacted by this effort.

Governor's Coding Challenge

Governor Larry Hogan held the first ever Coding challenge for 100 middle school and high school aged girls. Workshops were held in the morning where the girls got to select which of the 5 events they would like to participate. MCWIC provided 3 of these hands-on workshops-

Robotics Challenge, Python Art, and Phone App Development. The sessions each had 20 girls learning a different skill set. In the afternoon, the girls competed in groups of 3-4 participants where they proposed a website or app that would help solve an issue in the state. Two of the three winning teams were made of current and/or past CompSciConnect participants. The grand prize winner is working with the Governor's staff to develop their project.

Girls Who Code- University of Maryland Chapter

Led by 6 undergraduate women in computer science and several other volunteers, over 80 girls in grades 6th-12 met weekly and learned coding fundamentals while also building a strong community of computing women. The students were divided into two classes based on experience due to the large number of participants and volunteers.

Current Students

Throughout the year, MCWIC offers a wide arrange of professional development, community building, and tutoring support for our current students. Over 750 current students were impacted by the programs in MCWIC.

MCWIC Tutoring Program

MCWIC tutoring is offered each semester for CMSC 131, 132, 216, and 250 from the third week of the semester to the last week of classes. In Fall 2018, we were asked to expand tutoring to the CMSC 351 courses. In Spring 2019, both CMSC 330 and 351 were added. With the growth of tutoring, drop-in sessions were replaced with course specific guided study sessions. Each semester 12 students are hired to host tutoring sessions. Over 175 students benefited from the tutoring program during the 2018-2019 academic year with over 900 tutoring sessions completed.

In order to best support incoming students, a new Intro to Computing Bootcamp was launched for students entering CMSC 131 with no prior computing experience. The Bootcamp was offered twice in the Fall and once in the Spring with a goal of introducing students to computing, best practices in projects, and resources available to them. 120 students attended 900the Fall session and 40 students attended the Spring session.

Key Stats for 2018-2019

- 12 undergraduate tutors each semester
- 12 hours of drop-in tutoring offered each week
- Over 30 hours of 1:1 tutoring offered each week
- Intro to Computing Bootcamp: 150 attendees across three sessions
- Total 1:1 tutoring appointments: 477
- Total students in guided study sessions: 436

Grace Hopper Celebration

With support from the BRAID initiative, Brendan Iribe, and other corporate sponsors, the University of Maryland and MCWIC are able to fund at least 50 students to attend the Grace Hopper Celebration each year. Students gain valuable connections, resources, career opportunities, and advice. In 2018, MCWIC along with the department supported 55 students

and 5 faculty/staff. The iSchool supported 10 students. 26 students secured funding from outside sources. In total, 91 UMD students and 9 faculty/staff members attended.

Key Stats for 2018

- 91 UMD students attended the Grace Hopper Celebration in Computing Conference

Professional Development and Social Events

Each semester the Center provides professional development opportunities for our students. Events can range from insightful talks by industry leaders or faculty from other universities or panels and round-table discussions. In collaboration with student organizations, we also host social events for women of the department to get to know each other. Many of these events were held in conjunction with the Peer Mentoring Program. Events in 2018-2019 included: Welcome Back Dinners (each semester), Grad Women Lunches, Grace Hopper Networking Night, Cookie Decorating Social, Making the Most of Conference, Intern Panel, Alumni Panel, and the Conference Scholarship Process.

Tech + Research: Welcoming Women to Computing Research

The Department of Computer Science at the University of Maryland and the Center for Women in Computing presented the Tech + Research: Welcoming Women to Computing Research, a three day research workshop geared towards engaging undergraduate women in computing. During this workshop, student teams came together and collaboratively worked together to use technology to solve pressing issues.

In collaboration with Technica, the largest all-women hackathon in the nation, 64 students participated in the Research track at Technica through 10 hands-on research projects with faculty. The weekend event brought together computing faculty from institutions across the state of Maryland to serve as mentors on projects in their research areas. Along with providing hands-on research experience in a dynamic hackathon setting, the weekend workshop included sessions introducing attendees to the basics of computer science research (CSR) and highlight the exciting opportunities that come with pursuing a graduate degree in computer science. Students presented their projects as part of the demo session at Technica. Plans are underway to host the workshop again in November 2019. This project was funded through the National Science Foundation (NSF).

Peer Mentoring

In Fall 2018, a new peer mentoring program was launched. Over 80 students were grouped across 8 computing track clusters. Large group meetings on professional development topics such as academic success, networking, imposter syndrome were held monthly. Socials and talks were hosted each month. Based on student feedback, the mentoring program shifted to 1:1 peer mentoring in the Spring. 40 students participated in the Spring program. Based on the success of this program, MCWIC is expanding the peer mentoring program to all students under the Iribe Initiative for Inclusion and Diversity.

Employer Spotlight

As part of our growing Corporate Partner's program, employer spotlights were added to our programing in 2018-2019. Advocate level partners hosted 1:1 meetings, coffee chats, round table discussions, and workshops to support our students. Treats and swag were often sent to encourage students to learn more about the different organizations.

Student Organization Support
The Center supports The Association for Women in Computing and GradWomen to build community and create events to empower and support women computing students across campus. These organizations actively recruit women into technical majors, and work to retain women in the field.

MCWIC also supports the Girls Who Code chapter at UMD. The Girls Who Code chapter is led by UMD undergraduates and meets 10-12 weeks out of the semester with girls 8th-12th grade girls interested in computing. Over 80 girls participated in the program during the 2018-2019 academic year. Each week, we help Girls Who Code book space and market their event. Snacks and computers are provided as needed. Additional support is provided as requested.

The University of Maryland hosts a very large hackathon,Technica, the largest all ladies hackathon in the US. This effort is student led and had over 900 participants this year with participants from colleges around the east coast as well as high school women. In Fall 2018, the MCWIC supported Technica through the Tech + Research program.

Funding was given to CodeBlack to help support 10 students to attend AfroTech

Student Advisory Board
To prepare for the launch of the Iribe Initiative for Inclusion and Diversity, a student advisory board was created in February 2019 to gain student feedback, ideas, and support on student needs around inclusion and diversity within the Department of Computer Science. Two undergraduate advisors served as advisors and liaisons to the board. 16 students met 1-2 times per month to make recommendations and address issues around climate and inclusion within the department. In May 2019, the advisory board hosted an end of semester ice cream social with over 700 students in attendance. The student advisory board will continue as part of the Inclusion Initiative.

Big Ten Academic Alliance - Women in STEM Summit
https://www.pbs.org/video/santana-stem-1559917614/
With support from the Provost's office, MCWIC participated in a 4 day workshop at Rutgers University where 10 of the Big Ten schools collaborated to share, compare and brainstorm new ideas of how to recruit and retain more diverse populations into the STEM fields. The goal of the Summit was to work collaboratively to design new initiatives to increase equity in undergraduate, graduate and faculty ranks at the Big Ten universities.

Research Efforts

CompSciConnect/Laboratory for Telecommunication Sciences

MCWIC conducts research to evaluate its programs and to understand confidence, exposure and access to K-12 education in computing for underrepresented students. Through one-day workshop styled events, summer camps and after-school programs, pre- and post- surveys are collected from student participants. An initial analysis of surveys collected show several trends in the lack of encouragement and exposure to computing that middle school students receive and shows that our outreach efforts do have a positive impact on student confidence in the field of computing. Findings were recently presented at the student poster session of Richard Tapia Celebration of Diversity in Computing. Our research student, Elana Katzen, won best undergraduate poster at Tapia. Research will be submitted for consideration to several other conferences this year.

Maryland Center for Computing Education [MCCE]

For many years, MCWIC has partnered with other programs improving the computing education K-12. This began with the CS Matters in Maryland Project and has now expanded to participating in the statewide steering committee for computer science education. This steering committee developed 15 year goals for the state and has, more recently, been instrumental in the creation of the Maryland Center for Computing Education (housed at the USM offices just off campus). Dr. Jan Plane is currently the chair of the steering committee. The MCCE's primary goal is in the preparation of teachers for computing across the grades and across the state. MCWIC partners with MCCE to ensure that diversity, inclusion and equity are major considerations in those goals and is a member of its advisory board.

BRAID

The BRAID initiative includes fifteen computer science departments across the U.S. including the **University of Maryland** that are committed to implementing changes to their introductory computer science courses, pathways into the major, departmental climate, and outreach efforts in hopes of diversifying their computer science majors. In return for funding, we provide data on the computer science department and our students. Updated research can be found here.

NCWIT Learning Circles

In January 2019, the University of Maryland Computer Science Department was invited to participate in the National Center for Women in Technology (NCWIT) Learning Circles program. A committee to faculty and staff across the department was formed to lead this project. During this project, the Committee works closely with the NCWIT Extension Services Consultant (ESC) and an NCWIT social scientists. The ESC directly guides the Committee in using evidence-based practices and methods for recruiting and retaining women at the University of Maryland. Bi-Weekly meetings occurred during the spring addressing topics such as data analysis, branding, climate issues, and recruitment and retention best practices. This program will continue into the 2019-2020 academic year.

Professional Conferences

SIGCSE-Special Interest Group on Computer Science Education: Dr. Jan Plane had two papers on Computer Science Education and Professional Development for teachers presented at SIGCSE in March 2019. Kate Atchison presented a lighting talk, Building a Community of Undergraduate Women: Ambassadors for Computing Outreach, on best practices for the MCWIC Ambassador program.

American Education Research Association: Additional research around teacher preparation and diversity in computing were presented at the AERA conference in Toronto during April.

NCWIT Summit: Dr. David Mount, Dr. Jan Plane, and Apitchaya Pimpawathin attended the 3 day summit in Nashville discussing best practices for recruiting and retaining women in computing.

Looking Forward

The Iribe Initiative for Inclusion and Diversity in Computing was created in February 2019 with a $1 million gift from Brendan Iribe, University of Maryland alumnus and co-founder of the virtual reality company Oculus. The Initiative aims to increase diversity and foster a stronger environment of inclusion in the university's Department of Computer Science.

The Initiative will serve as an umbrella over the Maryland Center for Women in Computing. Over the next year, many of our programs will be expanded and rebranded underneath the new initiative. While we will still maintain programming and create spaces for students who identify as women, we seek to expand our efforts to generally serve students who are underrepresented in computing. We outline the factors of diversity and identity that we seek to focus on in our mission statement.

Under the new Initiative, we were able to hire two new full-time Coordinators who will assist in the expansion and development of programming. Dr. Jan Plane and Kate Atchison will serve as the Director and Assistant Director of the Iribe Initiative for Inclusion and Diversity in Computing and the Maryland Center for Women in Computing, respectively.

In Spring 2019, the Inclusion Speaker Series and the Tutoring program were rebranded underneath the Initiative. These programs will continue to grow and expand in 2019-2020.

IRIBE INITIATIVE FOR INCLUSION & DIVERSITY IN COMPUTING

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Mission:
The Iribe Initiative for Inclusion and Diversity in Computing is committed to making computing a field that includes participation of individuals across the intersections of gender identification, race, ethnicity, socioeconomic status, sexual orientation, and disability status. We aim to create a vibrant, inclusive community of students, educators, and researchers coming together to increase the involvement—and success—of underrepresented populations interested in computing.

Plans for 2019-2020 Year

- 1 New Residential Camp- AI4ALL Camp in Summer 2019
- 3 New Day Camps- JumpStart Computing (elementary), Intro to Computing (high school), and Wearables (high school)
- Expansion of the Peer Mentoring Program to all undergraduate and graduate students
- Structured Support for Student Organizations
- Launch of Sisters RiseUp4CS- online tutoring for high school girls in AP Computer Science
- Formal and Informal Faculty and Staff Training on climate, inclusion, and diversity topics
- Creation on a Best Practices Inclusivity Handout
- Expansion of support of students to diversity conferences including Tapia, Grace Hopper, and AfroTech among others
- Revamp and expansion of the Inclusion Speaker Series
- Continued partnership with the Student Advisory Board in gathering student feedback and ensuring representation

Additional Diversity Efforts across the Computer Science Department

The CMSC's Diversity and Inclusion Committee has been active in collecting survey data from faculty, staff and students and then aligning that survey data with the university's efforts in the same area. This data will then be used to ensure the goals of the thriving workplace initiative are implemented and effective within the department. The committee is specifically looking at hiring practices and graduate student admission practices to better understand diversity and inclusion in these contexts.

Fiscal Year 2019 Budget total:
Annual Budget Allocation
$50,000- College of Mathematical and Natural Science
$25,000- Dept of Computer Science
$25,000- UMIACS (University of Maryland Institute for Advanced Computer Studies)

Additional Financial Support

- $100,000 yearly from Brendan Iribe- 2017-2021
- $50,000 Brin Family Foundation
- $25,000 yearly- AFCEA Bethesda- earmarked for Outreach/CompSciConnect
- $40,000 yearly from NSA's research lab - Laboratory Telecommunication Science (LTS)- earmarked for research
- Corporate Partner Support/Alumni Giving- ~$32,000 for 2018-2019
- Registration Fees for some of our programs
- Various Gifts and Grants- NCWIT, CSMatters-NSF, Oculus Outreach, and RiseUp4CS-Georgia Tech

2018-2019 Corporate Sponsors
Advocate Level ($5000+):
Appian
Adobe
Capital One
Google
ValidaTek

Additional Support ($2000+):
Easy Dynamics
General Dynamics Mission Systems
Johns Hopkins Applied Physics Lab
Northrop Grumman