

# AIRBUS



# AIRBUS GEDC DIVERSITY AWARD

Celebrating projects around the world increasing  
Diversity in Engineering Education



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# About the Diversity Award

The Airbus GEDC Diversity Award is a partnership between Airbus and the Global Engineering Deans Council (GEDC). Shaped from an Airbus desire in 2012 to reflect the world in its employees and to provide access to STEM for all, the Airbus GEDC Diversity Award was born.

The award aims to shine a light on successful grass roots projects that inspire students from all profiles and backgrounds to study and succeed in engineering. In 2017, the United Nations Educational, Scientific and Cultural Organization (UNESCO) granted patronage to the award and for the 2018 edition a partnership agreement was signed.

The long-term aim of the award is to increase diversity amongst engineering professionals globally, so that the engineering industry reflects the diversity of the communities it supports. With more diversity, we can also stimulate innovation and ensure that more students have the opportunity to experience and value working in diverse teams during their studies.

This initiative was unveiled in October 2012 at the World Engineering Education Forum (WEEF) in Buenos Aires, Argentina. From the 18 finalist projects recognised in the first six years of the award alone, over 125,000 students who otherwise may not have chosen engineering have been directly impacted.

198

**ENTRIES**

140

**INSTITUTIONS**

37

**COUNTRIES**

# Using this e-book

This e-book aims to showcase the outstanding initiatives selected for the Diversity Award shortlist between 2013 and 2018, and to celebrate the achievements of the individuals and teams behind them. Since the 2017 edition, in a change from previous years, the award is given to a project, rather than to an individual nominee.

Together, Airbus, the GEDC and UNESCO want to recognise exceptional efforts to increase diversity and inclusion around the world and inspire others to replicate leading initiatives in their own institutions. We hope that the visibility gained from publication within this e-book will support the continuation of the great work of these cutting-edge projects.

# Forewords



Diversity is a key driver of innovation. To stimulate change, we must strive to build diverse and inclusive teams. With the Airbus GEDC Diversity Award, we are proud to work with the GEDC and UNESCO to celebrate the remarkable dedication and innovative approach of individuals and teams who are working to inspire the next generation of engineering talent.

## **Jean-Brice Dumont**

Executive Vice President  
Engineering, Airbus  
Commercial Aircraft  
Patron of the Airbus GEDC  
Diversity Award



By recognising those who demonstrate an outstanding commitment to enhancing diversity, the global Airbus GEDC Diversity Award continues to promote innovation in engineering education. We are proud and thankful for this great partnership with Airbus that embraces our commitment to promote and recognise good practices in diversity and inclusion around the world.

### **Natacha DePaola**

Carol and Ed Kaplan Armour  
Dean of Engineering  
Professor of Biomedical  
Engineering, Illinois Institute of  
Technology, USA  
GEDC Chair 2017-2019



UNESCO is thrilled to be a partner of the Diversity Award which strives to inspire and cultivate a new generation of engineers from diverse communities; it increases awareness of the importance of engineering for sustainable development and also harvests relationships between universities and industry.

### **Flavia Schlegel**

Assistant Director-General for  
Natural Sciences, UNESCO

# Diversity Award

PEOPLE AND PROJECTS AROUND THE WORLD



We are pleased to present the **finalist** (●) and **shortlisted** (●) projects from around the world selected for their work in improving diversity in engineering education.



**Click the map to discover more about these remarkable projects in these regions.**





● FADI ALOUL

# AFRICA & MIDDLE EAST



## Fadi Aloul

Professor of Computer Science and Engineering  
American University of Sharjah, United Arab Emirates



**2015 RECIPIENT**

Fadi Aloul was selected as the award recipient for his key role in developing a programme to introduce first-year undergraduate students to the engineering profession and stimulate their critical thinking and creativity. Results show that the course has had a positive impact on the students' interest in engineering and helped to increase their motivation and deepen their understanding of the relevance and impact of their own discipline in solving real-world problems. The retention rate has increased over the years, reflecting the course's significant impact in attracting and encouraging students with different profiles and backgrounds to study and succeed in engineering.

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I'm proud of me and my team being able to develop a course which uses low cost materials and very minimal resources but yet was able to attract students and make an impact. A very important aspect of this course is that students are randomly placed in multidisciplinary diverse teams and must work on several projects together. Most of these members realised the importance and the advantage of working in diversified teams and came back to us with positive results. In my opinion, diversity is the key driver to success, innovation and creativity.

**Fadi Aloul**

Project Representative

## IMPACT



Over 10,000 students from 92 nationalities have taken part, with an average of 35% female students.



Results show that the number of students answering correctly increased between the initial exams and final exams suggesting that the students' performance and attraction to engineering increased during the course.

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**BIRDS SATELLITE PROJECT**



**ISTEAM UNDERWATER ROBOT COMPETITION**



**MARITA CHENG**



**UNSW WOMEN IN ENGINEERING**



# ASIA PACIFIC



# BIRDS Satellite Project

Represented by Taiwo Tejumola, Project Manager

The Kyushu Institute of Technology, Japan

**2017 RECIPIENT**

BIRDS Satellite Project trains graduate students from developing countries (Ghana, Nigeria, Mongolia, Bangladesh and Thailand) in using cost-effective innovative systems engineering to execute a comprehensive two-year satellite project, with the long-term goal of equipping them to commence a sustainable space programme in their respective home countries. This collaborative programme provides an opportunity for young engineers to compete in today's global market by teaching specialised waste-minimising systems engineering models, developing core skills and building a supportive peer network. The project creates a sustainable pathway for participants to implement training initiatives in their home countries, contributing to the globalisation of engineering education.

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The BIRDS satellite project has created over the years a network of mid-career engineers from developing countries and an Integrated global ground infrastructure that can support them to achieve the project aim of institutionalizing space technology in their respective countries thereby bridging technological divide.

**Taiwo Tejumola**  
Project Representative

## IMPACT

- ◆ 10,000 children have been reached across the 6 countries.
- ◆ 2,000 students will be trained over the next 5 years in participating members' institutions.
- ◆ The satellites have been successfully operated at 7 ground stations.
- ◆ The project has produced 5 peer-reviewed journals and 20 conference papers.



# iSTEAM Underwater Robot Competition

Represented by Kam Tim Woo, Associate Professor of Engineering  
Hong Kong University of Science and Technology, Hong Kong

**2018 FINALIST**

A robot design competition for children of all backgrounds and abilities, including those with special educational needs, disabilities, and underprivileged and ethnic minorities. Participants discover 3D printing technologies, laser cutting techniques and NFC technologies, and receive a virtual budget to purchase components for their robots. They benefit from a stimulating iSTEAM learning experience (inclusion, Science, Technology, Engineering, Arts & Design and Mathematics) through collaboration with other teams and mentoring by multi-disciplinary university students. Over 1000 children from 139 schools have participated since 2015. The project aims to nurture the engineers of the future and contribute to the inclusiveness of society.

[> ABOUT UNIVERSITY](#)

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Engineering in the Community and Equal Learning Opportunity are two core beliefs of this project. iSTEAM allows us to work together with different people in addressing both STEAM education and collaboration for a diverse group of contestants. It provides a great opportunity for an award-winning HKUST Robotics team to share their professional knowledge with young people.

**Kam Tim Woo**  
Project Representative

“Girls can be every bit as great a scientist or engineer as boys!”

*Female student, champion of the 2015 HKUST Underwater Robot Workshop & Competition*

“I always find it hard to pay attention in science class. At the competition I feel my voice is heard and my mentors have the patience to work with me.”

*Student with special educational needs.*

## IMPACT



1000 children from 139 schools have participated over four years



A record 400 students from 45 schools participated in 2018



64.24% of participants in 2017 strongly agreed that “After the competition, I have more interest in science and technology.”



## Marita Cheng

Founder and Executive Director

Robogals, Australia

**2014 RECIPIENT**

Marita Cheng is the founder of Robogals, an initiative designed to inspire girls aged 10–14 to choose engineering and technical careers, as well as a global community of engineering students committed to the cause of greater diversity. Through a varied, exciting programme of workshops, training, student challenges, a Robogal Ambassador programme and a dedicated outreach programme for rural and regional areas, Robogals has so far reached over 80,000 girls worldwide, utilising a largely volunteer workforce of university students. From its inception at the University of Melbourne it has grown into an international organisation with chapters at over 30 universities.

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Prior to us coming in, most of the girls had no idea what engineering is. I know that outreach works because it worked on me. We need to be teaching our kids from as early as primary school how to make stuff, from robotics workshops to computer programming, to show them how the things they're doing in the classroom relate directly to amazing real-world applications.

**Marita Cheng**

Project Representative

## IMPACT



Since receiving the award, Robogals has gone from strength to strength, expanding operations to Kenya, Indonesia and Japan.



Globally, Robogals has inspired 12,212 young girls in the past 12 months, bringing the total number of girls inspired through interactive workshops to over 80,000 girls since founding in 2008. (Data from 2017).



Robogals has taught girls from 11 countries.

[> PROJECT VIDEO](#)

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## UNSW Women in Engineering (WIE) Programme

Represented by Alex Bannigan, Manager of Women in Engineering,  
University of New South Wales, Australia

**2017 FINALIST**

The Women in Engineering (WIE) Programme aims to break down barriers and raise awareness of engineering opportunities for women, improving recruitment and retention of female engineers through outreach, scholarships and opportunities at all academic levels, from school students to professional engineers. The programme delivers a comprehensive range of workshops and activities targeted at changing the image of engineering among female students, parents, employers, and teachers. Alumni and industry partners are engaged as speakers, mentors and sponsors. The project's mission is to address gender imbalance and create a strong community of support and guidance for engineering students at a national level.

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UNSW has increased the number of women starting engineering degrees by 45% between 2013 and 2017. To achieve this, we have fostered a culture of belonging – seeing a place for yourself in the future. Young women are choosing to study with us because they have heard about our Women in Engineering Program – so the initiative is self-perpetuating.

**Alex Bannigan**  
Project Representative

I met so many new people and learnt so much about engineering, including how many career opportunities there are for women out in the workforce. Before the camp I was unsure if engineering would be a career prospect but after the camp I think I can almost definitely say that it will be. I would definitely encourage other girls to go on the camp and discover so much more about women in engineering.

**Rachel Birrell**  
WIE Camp attendee

## IMPACT



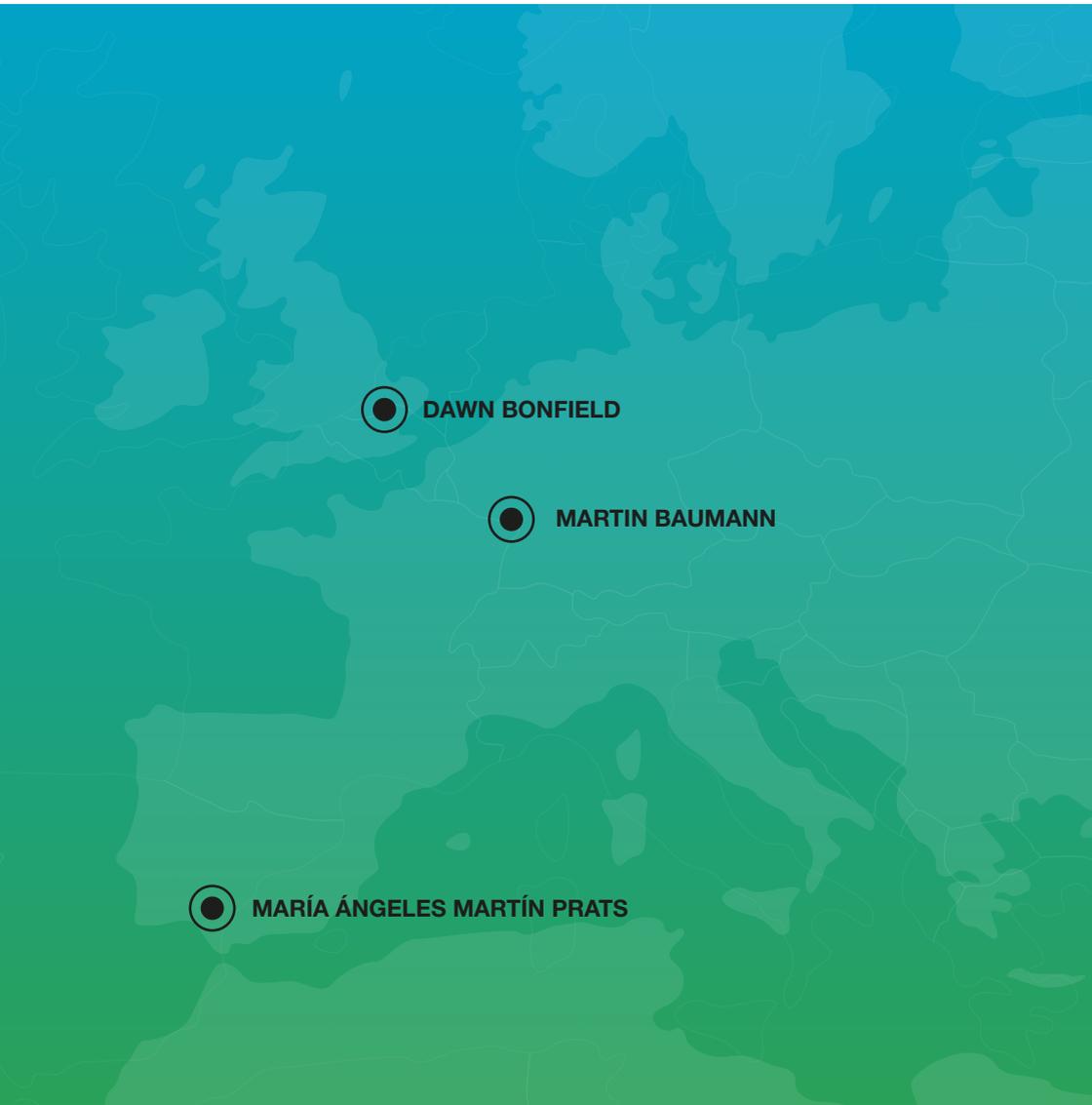
Between 2013-2017, the number of women studying engineering at UNSW has increased by 45%.



15-20 high schools are visited each year to speak with girls about engineering and/or run hands-on engineering activities.



Five on-campus engineering days for girls are hosted each year. Collectively, these activities reach approximately 2,500 girls annually.



**DAWN BONFIELD**

**MARTIN BAUMANN**

**MARÍA ÁNGELES MARTÍN PRATS**



# EUROPE



## Dawn Bonfield

Past President and former Chief Executive  
Women's Engineering Society, United Kingdom

**2016 FINALIST**

Dawn created International Women in Engineering Day, a UNESCO-supported global awareness day to raise the profile of women in engineering and focus attention on the exciting career opportunities available to girls in the engineering sector. It takes place annually on 23 June. The initiative has reached schools, universities, colleges, youth organisations, Professional Engineering Institutions, parents, and the corporate sector; targeting girls and women while recognising the need to ensure that the whole community is responsible for delivering diversity and inclusion. The role of WES is to promote and coordinate the day and generate as much engagement as possible from participants.

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Innovation requires diversity so you get a range of thinking and different strengths. Engineering isn't visible enough to young people at school. It's not taught as a subject and people aren't clear about what professional engineers do. The second problem is the stereotypes we have about girls and boys; it starts very young, in the toys we give them, what they pick up in school. We will not make the big step change until we start to address these societal issues.

**Dawn Bonfield**

Project Representative

We invited mentors in to our school, and I used the WES Materials, and it was awesome! The children thought it was really engaging, having some really interesting people coming in from their working lives to meet them was brilliant! Congratulations on a great set of resources!

**Mark Brown**

Whitworth Park School

## IMPACT



National Women in Engineering Day 2016 saw 200 separate events and 350+ school events UK-wide.



The official hashtag #nwed2016 trended for 8 hours on the day, with over 15,000 posts.



National Women in Engineering Day was reported in over 150 newspapers and online articles.

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## María Ángeles Martín Prats

Associate Professor, Department of Electronic Engineering  
University of Seville, Spain

**2013 FINALIST**

María Ángeles Martín Prats specialises in Electronic Technology and was selected for her work in mentoring, networking and increasing the visibility of women in aerospace engineering. She was the only female Associate Professor out of 54 male professors in her department at the time she was selected for the award. She is a board member of the European aerospace network PEGASUS and has promoted the participation of women in European student conferences and competitions. Through her intense and dedicated work and contacts with industry and international universities, María encourages and inspires women to study engineering and achieve high professional positions.

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The main goal is to increase and to promote the number of female students in engineering. Women and young people need people pushing with creativity to improve and change the current situation of women in engineering.

**María Ángeles Martín Prats**  
Project Representative

She is always available for us and willing to co-operate in every project. For the first time, in my class, more than fifty per cent of students are girls.

**Soledad Ortega González**  
Engineering student at the University of Seville

## IMPACT



The female engineering students at the university created a local branch of Women in Engineering (WIE) to promote engineering to future generations of students.



Being a finalist for this award has helped increase the number of women in aerospace engineering. In the class of 2016-17, one program had 65% female students (compared to an average of 15-20% in this field).

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## Martin Baumann

Adjunct Professor, Institute of Applied Medical Engineering  
RWTH Aachen University, Germany

**2015 FINALIST**

Martin Baumann was selected for his work on enabling students with disabilities and diverse learners to be assessed on an equal basis with all students. He has developed a range of tools to assist students and support teachers, and works directly with students concerned to create the interfaces and devices required to meet their needs. Initiatives include interface optimisations for left-handed and ESL students and enhancing legibility for partially sighted students, as well as a module that reads out questions to the students and accepts spoken answers. All students can be confident that they are treated equally and fairly.

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The most positive impact of my work with students is that I hope to give them the feeling that they are not treated differently. Diversity is important because [...] the more opinions you get for problem solving, the higher the chances that the problem is really solved.

**Martin Baumann**  
Project Representative

## IMPACT



The first e-assessment in this initiative was in 2004 with 12 students.



More than 30,000 students have been able to take adapted e-assessments since 2004.



Up to 5 percent of students per assessment require this initiative's special service.

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DISCOVER ENGINEERING PROGRAMME

MARY WELLS

CATHERINE PIERONEK

RENETTA TULL

YACOB ASTATKE

ANA LAZARIN

BEVLEE WATFORD

NASA SWARMATHON

BRYAN HILL



# NORTH AMERICA



## Ana Lazarin

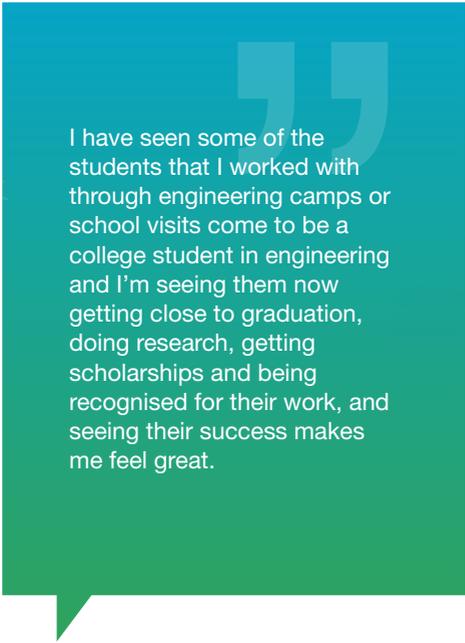
Director of Programs to Broaden Participation in Engineering  
**Engineering Student Success Center, Wichita State University, USA**

**2013 FINALIST**

Ana Lazarin was selected for her outreach, recruitment and retention programmes which have significantly increased the number of underrepresented students in the College of Engineering at Wichita State University. As an engineering student at WSU, she founded a student chapter of the Society of Hispanic Professional Engineers (SHPE). Since then, she has developed relationships with schools and community organisations to establish a pipeline for engineering students. The Engineering Summer Camps, the Changing Faces Program, and Community Outreach Events have captured the interest of many underrepresented students by educating them about the different fields of engineering and what engineers really do.

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I have seen some of the students that I worked with through engineering camps or school visits come to be a college student in engineering and I'm seeing them now getting close to graduation, doing research, getting scholarships and being recognised for their work, and seeing their success makes me feel great.

**Ana Lazarin**  
Project Representative

## IMPACT



From 2007 to 2012 the number of women enrolled in engineering increased by 10% and the number of minority engineering students increased 97% at Wichita State University.



The Engineering Summer Camps served fifty-six students during the first year in 2007 and have increased by 400% by serving two hundred and fifty-seven students in 2012.



The College of Engineering Ambassadors program started with two Ambassadors in 2010-2011 and has grown to 18 students.

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## Bevlee Watford

Professor of Engineering Education, College of Engineering  
Center for Enhancement of Engineering Diversity, Virginia Tech, USA

**2014 FINALIST**

Bevlee Watford was selected for her wide-ranging programmes aimed at building an inclusive and diverse engineering student body at Virginia Tech. She leads the Center for the Enhancement of Engineering Diversity (CEED), which provides support and leadership opportunities to engineering students, with a particular focus on the underrepresented population. Students involved in these programmes achieve higher average grades, retention and graduation rates than their peers who are not participating. Professor Watford also works with pre-college students to increase awareness of engineering as an exciting and rewarding career path. Her work is used as a model for institutions throughout the USA.

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CEED is designed to provide support for undergraduate students, particularly students that are underrepresented in engineering. In the College of Engineering here at Virginia Tech those populations are African American students, Hispanic and Latino students, and women. We also reach out to pre-college students to let them know what engineering is and to teach them the kind of things that we do and how much fun it can be.

**Bevlee Watford**  
Project Representative

I would recommend CEED to any incoming students because it provides them with opportunities that they might not experience if they aren't involved with CEED, whether it be mentoring or internship opportunities. All the opportunities that have been given to me have really helped me.

**Allison Collier**  
inVenTs Leadership Team Member

## IMPACT



Over 10,000 engineering students mentored through the programme since 1992.



Being a finalist for this award brought great visibility for the office and programs. Their success was noted by university and corporate partners and resulted in greater support for their efforts.



Since being involved in the award, Bevlee became the first African American female president of ASEE (American Society for Engineering Education).

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## Bryan Hill

Assistant Dean for Student Recruitment and Diversity, College of Engineering  
**Engineering Career Awareness Program (ECAP), University of Arkansas, USA**

### 2014 FINALIST

Bryan Hill was selected as a finalist for his initiatives to recruit, retain and support underrepresented engineering students. The Engineering Career Awareness Program (ECAP) at the University of Arkansas provides financial assistance to qualifying students who are underrepresented in the field of engineering. ECAP students' academic performance (cumulative GPA) was equally as good as or significantly better than their engineering peers. Since 2009, all College of Engineering undergraduates have been surveyed regarding their attitudes towards diversity; results show that levels of symbolic racism have decreased, suggesting that the presence of ECAP students has contributed to a more racially tolerant environment.

We're growing the pipeline of students, but more importantly we are making sure that's a diverse pipeline. If we look at the population of freshmen that just came in – if you took all female freshmen, ethnic minority males and first-generation Caucasian males – 53% of the freshmen class was underrepresented. Many of these students need the ECAP programme.

**Bryan Hill**  
Project Representative

ECAP helps students take their degree to a whole different level. By the time you leave, you've gained experience through internships, research, talking to people, meeting people. You have a network, you've learned about life in general and what it means to be an engineer.

**Engineering student**  
University of Arkansas

## IMPACT



Between 2007 and 2014, minority enrollment in engineering increased by more than 190%, with 150% rise in female undergraduates.



ECAP students had significantly higher rates of retention in engineering. ECAP students entering COE in 2007 and 2008 achieved 4-year retention rates of 61.9% and 70.4%, respectively, rates significantly better than those experienced by the engineering cohorts at that same time (42.0% for 2007 cohort, 49.4% for 2008 cohort).



The six-year graduation rate for engineering students is significantly higher for ECAP students (71.4%) as compared with their non-ECAP peers (44.0%).

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## Catherine Pieronek

Associate Dean for Academic Affairs, College of Engineering

**Women's Engineering Program, University of Notre Dame, USA**

**2013 FINALIST**

Catherine Pieronek (deceased) led the Women's Engineering Program and Minority Engineering Program at the College of Engineering, University of Notre Dame. Catherine was selected as a Diversity Award finalist for her data-driven approach to understanding why women and underrepresented students tended to leave the engineering programme at a higher rate than white male students. In her work, she identified systemic issues that keep underrepresented students from full participation in engineering programmes and implemented solutions to improve the retention of all students. Her research has been published in the peer-reviewed Journal of College & University Law. Catherine sadly passed away in 2015.

My role is to make sure that our 1600+ undergraduate students get the best education they can and achieving diversity by meeting their individual diverse needs.

**Catherine Pieronek**  
Project Representative

In chemical engineering, half of my class are women so I don't feel like there's this gender gap at all. I definitely feel supported. I had the opportunity to have three faculty members that were women while in chemical engineering – that shows that you really can succeed. I think Notre Dame does a really good job of putting women out there.

**Kate Turner**  
Chemical Engineering student

## IMPACT



Within two years, the retention of women to sophomore year increased from 42% to 70%.



The retention of women became on par with the retention of men.



Because underrepresented minorities (URM) comprise a higher proportion of women than men, the improvement in the retention of women, coupled with stronger leadership in the Minority Engineering Program, saw an improvement in the racial/ethnic diversity of the engineering program, from 7% in 2002 to 14% in 2013.

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## Discover Engineering Programme

Represented by Qiao Sun, Associate Dean of Equity and Diversity

The Schulich School of Engineering, University of Calgary, Canada

**2017 FINALIST**

The Discover Engineering programme was designed to meet the Schulich School of Engineering's Strategic goal of 'Fostering Diversity' to transform the landscape of engineering. The recruitment and outreach initiative aims to help engineering appeal to a more diverse audience. 25 trained student facilitators, primarily from underrepresented groups themselves, lead engineering career workshops for Grade 11 and 12 students to help them learn about how the engineering industry helps to solve large problems in society. Additionally, the programme serves as a teacher learning opportunity, so that educators can provide students with informed career advice and incorporate engineering topics into the classroom.

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The programme goal is to increase the diversity of future University of Calgary students, helping them to develop a deeper understanding of engineering, introducing them to the wide range of career paths, and demonstrating how engineers solve problems in society.

**Qiao Sun**

Project Representative

When I graduated from high school in the 1980s there was little, if any, encouragement for girls to go into engineering. If I had the opportunity to attend a Discover Engineering Session, I might have entered the engineering field instead. The hands-on component and follow-up discussion had a very positive impact on how my students view engineering.

*A high school teacher who took part in 2016.*

## IMPACT



In 2016/17 approximately 1640 high school students from 66 schools participated in workshops.



31.8% of teachers agreed and 68.18% of teachers strongly agreed that the Discover Engineering program increased their understanding of the field of engineering.



27.7% of teachers agreed and 72.73% strongly agreed that they have an increased understanding of the Schulich admissions process.



## Mary Wells

Professor of Mechanical and Mechatronics Engineering,  
Chair, University of Waterloo,

**Ontario Network for Women in Engineering (ONWiE), Canada**

**2016 FINALIST**

Mary Wells has led a series of initiatives to uncover the causes of the continued lack of participation of women in engineering. To address these barriers, she has developed programmes to inspire current engineering students and young women in schools. Her work aims to connect girls with role models as a tool for envisioning their own futures. Under the leadership of Dr. Wells, the ONWiE network model has evolved from primarily running common outreach programmes to using the collaborative network model to engage the full spectrum of stakeholders required to effect change in the gender diversity of the engineering profession.

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Outreach activities that showcase the societal relevance of the engineering profession in our world, have engaging hands-on activities and highlight the roles that design and creativity play in the engineering profession, are crucial to inspire and excite young people.

**Mary Wells**  
Project Representative

WE GOT TO BUILD!!! Very friendly students helped me. This opportunity is amazing and those 2-4 hours I spent here were amazing!

**Go Eng** female participant

Before today I thought engineering was just for boys.

**Badge Day** participant

## IMPACT



3,000+ women reached annually, boosting female application and entry rates to Ontario engineering programmes by over 200%



From 2005 to 2015 there has been a ~20% increase in the number of girls taking grade 12 physics across Ontario.



In 2005 only 2,390 females in Ontario applied to study engineering. By 2016 that number had almost tripled to 6,932.

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# NASA Swarmathon

Represented by Professor Melanie Moses

The University of New Mexico, USA

**2018 FINALIST**

A swarm robotics programming challenge for students from Minority Serving Institutions. Teams program robots to autonomously locate and manoeuvre resources into a collection zone. Students construct robots using cameras, ultrasounds, magnetometers and motors, and use software collaboration and computer modelling tools to develop algorithms for search, localisation, sensor fusion, distributed communication and automated detection. Funded by NASA Education, the year-long competition culminates in a three-day tournament at Kennedy Space Center. In the first 3 years, over 1,500 students participated, 63% from underrepresented ethnic and racial groups. Students gained the skills and confidence to succeed in STEM postgraduate courses and careers.

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It is wonderful to have the hard work and accomplishments of the Swarmathon students recognised by an international aerospace leader. To successfully explore beyond our world will require the creativity and engineering talents of all of us here on earth. Airbus funding will help the diverse community of Swarmathon students to soar to new heights.

**Melanie Moses**

Project Representative

The skills I learned with the Swarmathon will take me a lot closer to my educational goals. When we first started the class, I didn't know anything about programming or C++. As the class progressed, I started learning a lot.

**Shulte Cooke**

Student, Southwestern Indian Polytechnic Institute

## IMPACT



Students from 44 different Minority Serving Institutions (MSIs) have been reached.



90% of teams returned each following year.



60 students attended a Swarmathon research workshop at the Robotics Science and Systems Conference. 80% of these students indicated a desire to go to graduate school, and 65% of them wish to pursue a Ph.D. in Robotics.



## Renetta Tull

Associate Vice Provost for Graduate Student Development and Postdoctoral Affairs  
**University of Maryland, Baltimore County, USA**

**2015 FINALIST**

Renetta Tull leads PROMISE: Maryland's Alliance for Graduate Education and the Professoriate (AGEP), sponsored by the National Science Foundation, to train undergraduate and graduate students, postdoctoral fellows and early-career faculty. The aim of the programme is to increase significantly the number of domestic students receiving doctoral degrees in the sciences, technology, engineering, and mathematics (STEM). This programme includes a global STEM diversity and inclusion initiative, with the overall aim of building global engineering workforce capacity through focused attention on increasing the numbers of future engineering faculty from underrepresented groups. Renetta Tull's work has resulted in a significantly increased pipeline of diverse STEM alumni and engineering programme participants.

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We have to continue to seek greater diversity in the world because at present there are people who are underrepresented. There's a term from the National Science Foundation called Broadening Participation. The idea means you're getting people from all backgrounds, all disciplines and from different communities working together for common goals.

**Renetta Tull,**  
Project Representative

## IMPACT



UMBC averaged 112 underrepresented minority STEM enrollees per year between 2002-03 and 2008-09 (up from an average of 35 per year between 1996-97 and 2001-02).



PROMISE was featured as part of the 2015 Council of Graduate Schools' Doctoral Initiative on Minority Attrition and Completion (DIMAC) project, and data from UMBC shows 149 UR STEM enrollees in doctoral programs between 2003-2012, and 76 who earned PhDs.



As of November 2018, the amount of funding has increased to \$22M in funding as PI or Co-PI.

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## **Yacob Astatke**

Assistant VP for International Affairs  
**Morgan State University, USA**

### **2016 RECIPIENT**

Dr. Yacob Astatke was selected as the recipient of the 2016 award for his impressive introduction of technology and training initiatives across universities in Ethiopia. For the past 14 years, he has worked to improve the delivery of engineering education in Ethiopia through teaching graduate courses, sharing best practice and delivering training. Since 2009 he has led the implementation of Mobile Studio™ Technology in five universities in Ethiopia. This portable instrumentation Input/Output IO-board enables students to conduct hands-on exploration of electrical and computer engineering (ECE) concepts. Dr. Astatke has been instrumental in facilitating the donation of equipment and other resources.

✉ [yacob.astatke@morgan.edu](mailto:yacob.astatke@morgan.edu)

☎ +1 443 6522 605

ECE students in Ethiopia (and Africa) have a very good theoretical understanding of engineering concepts. However, they lack the hands-on experience that is required to become an effective engineer because of the shortage of laboratory instrumentation that tends to be very expensive. In 2009, I introduced the Mobile Studio™ technology. The results were so encouraging that we decided to expand the technology and pedagogy to other ECE departments in the country.

### **Yacob Astatke**

Project Representative

## **IMPACT**



He has facilitated the donation of 200 Mobile Studio boards and 30 laptop computers to 5 universities in Ethiopia.



Dr. Astatke has worked to decrease the student to laboratory equipment ratio in core ECE courses from 15/1 to 5/1.



He plans to work with Teach and Serve for Africa (TASFA) to expand the donation of 100 new portable laboratory instrumentation boards to more than 30 universities in Ethiopia in 2019.



● SAVIALAB



# SOUTH AMERICA



## SaviaLab

Represented by Gabriela García,

Transference Manager, Pontificia Universidad Católica de Chile

**2018 RECIPIENT**

STEM education for indigenous minorities and young people in rural areas, bridging the gap of opportunities. Individuals are taught tools for context assessment to create initial prototypes, and at a more advanced level, receive a technological workshop including 3D printing (Fused Deposition Modelling) and basic programming of an Arduino (microcontroller). Since 2014, the project has engaged over 3,300 students from 7 regions. The project also empowers the minorities within its Engineering programme (women and first-generation university students) who travel around Chile, training teams and teachers, and become role models to young people who start viewing STEM careers as an opportunity.

✉ [ggarcime@uc.cl](mailto:ggarcime@uc.cl)

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Our pre-engineering early innovation programme has looked to empower students and teachers from rural communities since 2014. Throughout this process, our own students that represent minorities themselves, have re-signified their own engineering careers by translating their tech knowledge to others across communities.

**Gabriela García**  
Project Representative

Interacting with young engineering students as SaviaLab mentors empowered them to see that they also had the capabilities to come up with ideas, that they could also be a contribution to take care of the environment and the development of this country. With this, they realised that they could contribute to the base of their community.

**Marosol Soto**  
Teacher

## IMPACT



3,300 students from 7 regions in Chile have participated.



Of those, 16 female and 15 male university students correspond to minorities.



125 trained school teachers have received CPEIP certification from the Ministry of Education.

> ABOUT UNIVERSITY

> PROJECT VIDEO

> PROJECT INFO

# Global Shortlisted Projects

## AIMS<sup>2</sup> Program

**S. K. Ramesh,**

Director AIMS<sup>2</sup> Program and Professor of Electrical and Computer Engineering,  
California State University, Northridge, USA

> ABOUT PROJECT

## A Three-Pronged Strategy

**Shanthi Muthuswamy,**

Associate Professor,  
College of Engineering & Engineering Technology (CEET), Northern Illinois University

> ABOUT PROJECT

## Bridging Professorship "Gender and Diversity in Engineering"

**Carmen Leicht-Scholten,**

Chair of the Bridging Professorship "Gender and Diversity in Engineering",  
Faculty of Civil Engineering at RWTH Aachen University, Germany

> ABOUT PROJECT

## CBE (Chemical and Biomolecular Engineering) Women

**Susan Daniel,**

Associate Professor of Chemical and Biomolecular Engineering (CBE)  
and Director of Graduate Studies, Cornell University, USA

> ABOUT PROJECT

## Centre of Science and Technology (COSAT)

**Phadiela Cooper,**

Principal,  
Centre of Science and Technology, South Africa

> ABOUT PROJECT

## Community-based Project Programme (JCP)

**Martina Jordaan,**  
Senior Lecturer,  
University of Pretoria, South Africa

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## Computing Alliance of Hispanic-Serving Institutions (CAHSI)

**Ann Quiroz Gates,**  
Professor and Chair, Department of Computer Science,  
The University of Texas at El Paso, USA

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## Engineering Volunteers for Rising 9th Graders (eVOL9)

**Travis Griffin,**  
Program Director of Diversity Programs,  
Tickle College of Engineering, USA

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## Explorations in Diversifying Engineering Faculty Initiative (EDEFI)

**Ebony McGee,**  
Assistant Professor of Education, Diversity, and STEM Education,  
Vanderbilt University, USA

[> ABOUT PROJECT](#)

## FIRST Robotics Competition (FRC)

**Michael Heimlich,**  
Professor,  
Macquarie University, Australia

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## I Am Girl

**Angela Verdell,**

Director,

Bagley College of Engineering, Mississippi State University, USA

> ABOUT PROJECT

## Internationally-Educated Engineers Qualification Program (IEEQ)

**Marcia Friesen,**

Associate Dean (Design Education), Faculty of Engineering,  
University of Manitoba, Canada

> ABOUT PROJECT

## International Women's Degree Program in Computer Science (IFI)

**Prof. Dr. Gerlinde Schreiber,**

Faculty Engineering & Computer Science,

Hochschule Bremen - University of Applied Sciences, Germany

> ABOUT PROJECT

## Invent for the Planet

**Rodney Boehm,**

Director, Engineering Entrepreneurship and Associate Professor of Practice,  
Texas A&M University, USA

> ABOUT PROJECT

## OSE I'ISAE - Equal opportunity and access to excellence for all

**Maria Vauquelin Maria,**

Chef de Projet,

ISAE- Higher Institute for Aerospace Engineering, France

> ABOUT PROJECT

## OSE l'ISAE-SUPAERO

**Cécile Latournerie,**  
Project Manager,  
OSE l'ISAE-SUPAERO, France

[> ABOUT PROJECT](#)

## Passeport Ingénieur

**Sébastien Lailheuge,**  
Director of Operations,  
Passeport Avenir, France

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## R. C. Patel Institute of Technology

**Jayantrao Patil,**  
Principal,  
R. C. Patel Institute of Technology, Shirpur (MS), India

[> ABOUT PROJECT](#)

## Rural Women Technology Park

**Sai Satyanarayana Reddy Seelam,**  
Head of the Institution,  
Vardhaman College of Engineering, India

[> ABOUT PROJECT](#)

## School of Engineering, University of Pretoria

**Josua Meyer,**  
Chair, School of Engineering,  
University of Pretoria, South Africa

[> ABOUT PROJECT](#)

## Social Responsibility Unit, School of Engineering

**Juan Carlos de la Llera,**  
Dean of the School of Engineering,  
Pontificia Universidad Católica de Chile, Chile

> ABOUT PROJECT

## Software Engineering Program

**Luiz Fernando Capretz,**  
Professor of Software Engineering,  
Western University in Canada, Canada

> ABOUT PROJECT

## STEM Achievement in Baltimore Elementary Schools (SABES)

**Michael Falk,**  
Professor of Engineering; Vice Dean of Undergraduate Education,  
John Hopkins University, USA

> ABOUT PROJECT

## Students Teaching Students: A Summer Camp Program in Tissue Engineering

**Steven Abramowitch,**  
Assistant Professor,  
University of Pittsburgh, USA

> ABOUT PROJECT

## Texas A&M Engineering Academies

**Cindy Lawley,**  
Assistant Vice Chancellor of Academic and Outreach Programs,  
Texas A&M University, College of Engineering, USA

> ABOUT PROJECT

## The Donofrio Scholars Program at Syracuse University

**Julie Hasenwinkel,**

Senior Associate Dean, College of Engineering and Computer Science,  
Syracuse University, USA

[> ABOUT PROJECT](#)

## The Urban Gull Project: From Gulls to Drones

**Cara Williamson,**

PhD Candidate,  
University of Bristol, United Kingdom

[> ABOUT PROJECT](#)

## Women in Aviation/Aerospace Australia (WA/AA)

**Tamara Bell,**

Executive Director,  
Aviation/Aerospace Australia

[> ABOUT PROJECT](#)

## WomEng (Women in Engineering)

**Naadiya Moosajee,**

Co-Founder and CEO,  
WomEng, South Africa

[> ABOUT PROJECT](#)

## Women in Engineering and Diversity Hosting Weekends

**Alan Zehnder,**

Associate Dean for Diversity, College of Engineering, Cornell University, USA

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## Women in Engineering Leadership Association (WELA)

**Ann Lourens,**

Head of Department Industrial Engineering, Project Leader WELA,  
Nelson Mandela Metropolitan University (NMMU), South Africa

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/AirbusCareers



GROUPS:  
Airbus GEDC Diversity Award



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