Dear Friends of AMMACHI Labs,

I am writing to wish you all the best this New Year, 2017.

It has been an exciting and fast paced year at AMMACHI Labs with many updates, new initiatives and success stories. We hosted an International Conference on Robotics and Automation (RAHA 2016) and have made great strides in our research and development.

I am happy to share some good news with you. A UNESCO Chair on Gender Equality and Women Empowerment was established in the fall of 2016 at Amrita University. Through the lens of women empowerment and gender equality, the UNESCO Chair will focus on identifying vulnerabilities and potential solutions for women in India. AMMACHI Labs will continue its pioneering research and development in haptics, cVET, robotics and automation and other technologies for skill development. The Center will focus on projects for women empowerment and serve as an academic hub and the implementation agency for our many projects and will work closely with AMMACHI Labs to deploy skill development technologies into real life situations in the field.

Please enjoy these updates and feel free to share this newsletter. We are looking forward to an action-packed new year, and hope you will join us in our efforts. Thank you!

Rao R. Bhavani
Director, AMMACHI Labs
Director, Center for Gender Equality and Women Empowerment
Amrita University’s New Center for Gender Equality and Women Empowerment

UNESCO Chair on Gender Equality and Women Empowerment

In the fall of 2016, Amrita University and UNESCO inaugurated India’s first ever Chair on Gender Equality and Women Empowerment. The UNESCO Chair will further the Center’s goals and promote international, inter-university cooperation and networking to enhance institutional capacities and collaborative work. Gender Equality and Women Empowerment is one of UNESCO’s global priorities.

The Center for Gender Equality and Empowerment is a research focused academic center for promoting gender equality and fostering women’s empowerment with a special focus on technology and other innovative methods. This center will offer diverse courses on key focus areas, pilot radical ideas, and collaborate with leading universities and institutions to advance the initiatives. The center will also act as major resource center for the implementation of various development projects undertaken by the university and our parent organization: MA Math.

Mapping Vulnerabilities

The establishment of the Amrita University UNESCO Chair will support India’s progress towards achieving the UN’s 2030 Agenda for Sustainable Development. Understanding vulnerabilities in communities the key to designing effective interventional strategies to enable women everywhere to gain full access to basic human rights. We have outlined six verticals which align with the United Nations’ Sustainable Development Goals (SDGs).

Six Verticals

- Community, Personal Safety and Security
- Economic Stability and Livelihoods
- Education and Skill Development
- Social and Cultural Environment
- Climate Change and Disaster
- Health and Sanitation

Along the SDGs

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December 18-20th 2016 was buzzing with excitement at Amrita University throughout the International Conference on Robotics and Automation for Humanitarian Applications. RAHA 2016 was the world's first conference dedicated to robotics solutions for social good. There was overwhelming enthusiasm and participation by over 385 registrants, students, staff, and international delegates from all over the world. Speakers included Dr. Vijay Bhatkar, father of the Indian supercomputer, Ms. Meg Jones, Chief of Economic Empowerment at UN Women, Rehabilitation robotics expert Dr. Sunil Agrawal of Columbia University, founding co-chair of the IEEE Robotics and Automation Society, Technical Committee of Ethics, Dr. Ronald Arkin of Georgia Tech and Dr. Hajime Asama, University of Tokyo, Vice President of Robotics Society Japan, who was involved with the deployment of robotics technologies during the Fukushima disaster response. Highlights included talks, paper and poster presentations, robotics competitions, workshops and tutorials. Dr. Raj Madhavan and Prof. Rao R. Bhavani were the Program Co-Chairs.

A special “Beyond RAHA” task force was formed to ensure that the progress made at the conference forms the foundation for an international research agenda geared towards the humanitarian applications of robotics technology while following appropriate ethical guidelines. This team will continue the conversation through meetings and discussions, and compile and document policy recommendations.

In her role as Chancellor of Amrita University, Sri Mata Amritanandamayi Devi met with the invited experts and renowned scientists who had come to attend the conference. The researchers and experts expressed their appreciation to Amma for having hosted the world’s first conference on robotics for humanitarian application, and requested her to deploy solutions innovated at Amrita throughout the developing world. World-renowned economist and leader in the fight against global poverty, Dr. Jeffrey Sachs, Director of Earth Institute and University Professor at Columbia University, also shared his thoughts on Amrita University during his plenary talk. “I follow your work and innovative teaching methods that you’re developing, the haptic controlled teaching, the water projects and other sustainable development projects... And I just admire tremendously what you’re doing and hope that I can be a good partner with you as you continue to expand your work and your reach.” Overall, RAHA inspired a powerful, creative spirit that transcended science and technology. Using robotics and automation solutions to help solve societal challenges is such a blessing and Amrita University is at the forefront of this pioneering work.

Stay connected and engage in this exciting initiative at: www.raha2016.org

Beyond RAHA: Deepening the Conversation

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Women Empowerment and Research Projects for 2017-2018

Social Problem Solving & Vulnerability Mapping Through Toolkits:

We plan to use technology and take existing vulnerability mapping frameworks to create an app/toolkit that can be universally used to design policy and other local efforts. We will reimagine the existing VM framework (presently focused on disaster and risk) to represent a broader understanding of social problems in key areas.

NORRAG Project

"Reaching the Unreached: Skills Development Policies and the Promise of ICT – A Scoping Study from India and South Africa". This study looks at the potential of cVET in South Africa and India to enhance the reach and accessibility of TVSD among unreached and underserved populations - particularly the informal sector.

Collaborators:

The REAL Center at the University of Witwatersrand in South Africa, AMMACHI Labs of Amrita University and NORRAG at the Graduate Institute of International and Development Studies in Switzerland.

The 2ND FOUNDATION

Automation by advancements in computing and robotics are redefining the skills needed to compete in the 21st Century. Vital skills such as complex problem solving and collaboration with peers to succeed are a must for future job seekers. AMMACHI Labs’ Second Foundation series of workshops is an initiative to bring 21st century skills training to schools and rural areas. It is aligned with global standards like the P21 framework for 21st century skills, ACM-CSTA, NGSS, Common Core among others. The idea is to prepare today’s learners for tomorrow’s challenges.

800+ Students | 10 Rural schools | 10 States

MAKERSPACE

AMMACHI Labs is investing in a collaborative work space for making, learning, exploring and sharing. The space inspires creativity through a hands-on DIY approach that instills the “Maker-Mindset.” Participants are encouraged to develop a deeper knowledge and understanding of the world around them through making.

Champions of Change

"Reaching the Unreached: Skills Development Policies and the Promise of ICT – A Scoping Study from India and South Africa".

The goal is to empower 300 women in rural villages to champion sanitation and other social issues by mobilizing their community, engaging with government, and a global community to create effective and sustainable solutions in 21 states in India. The leadership and ICT trainings, and community-led sanitation campaign initiatives aims to mobilize 5000 women as Change Agents.

UNDEF – WE: CSDP (Community Sanitation through Democratic Participation)

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MoVE 2.0

Our solar-powered mobile classrooms will now be converted into mobile maker spaces.
2016 YEAR IN REVIEW

EMPLOYMENT THROUGH CVET + LIFE SKILLS TRAINING

21 STATES:
Training Centers Established in

30+ VILLAGES

5,000+ WOMEN from rural India empowered

6,000+ PARTICIPANTS trained through Life Skills programs (eg. Legal Awareness, Sanitation and Hygiene Awareness, Financial Literacy, etc.)

200+ TOILETS built and maintained by women

HCI, HRI AND UX RESEARCH

3 NEW COURSES
in User Experience and Innovation

7 SCOPUS PAPERS
accepted since the Summer

2 PROJECTS in
Human Robot Interaction for low literacy users
In conjunction with Live-In-Labs international students brought inventions for Rural Automation

**HAPTICS**

Computerized vocational and life skills training was deployed to 190 students across 4 schools in Kerala through mySangham.

Soon to scale to 27 schools across Kerala with new trades and social democratic topics.

**RI-CYCLE**

Load Bearing Automation

**OTHER HUMANITARIAN INNOVATIONS**

- Rubber tree tapping robot prototype
- Cable driven robot for coconut dehusking
- UAV for road accidents monitoring
- Gesture based UGV control for rural India
- UGV for soil sample collection

**2ND FOUNDATION WORKSHOPS**

800+ students
10 rural schools
10 states
Dr. Sidney Strauss, Professor (Emeritus), Branco Weiss Chair for Research in Child Development and Education, Tel Aviv University wrapped up a week long visit to Amrita University. One of the highlights was his engaging course: “Human Development, Learning and Teaching” which focused on pedagogies and methods and practices of teaching. The 2nd Foundation Project team from AMMACHI Labs also met with Dr. Strauss to brainstorm and review an upcoming training for mentors who will conduct workshops in 21st century skills training to schools in rural areas in Andhra Pradesh. It’s always a pleasure to learn from Dr. Strauss as his kind and gentle demeanor and witty humor makes him the most patient teacher! We hope to have Dr. Strauss back soon to teach more courses in cognitive development and teaching, learning.
After the RAHA Conference, Meg Jones made a special visit to Odisha to tour our women empowerment center in Guptapada. She was accompanied by her family and Prof. Bhavani and Bri. Sheeja, the Zonal Lead. They enjoyed visiting the skill training centers, the water distribution system and visiting with the village women. Villagers gave the guests a traditional welcome and extended their warm hospitality to the visitors. One highlight was an interactive and engaging session with Rural Toilet Building course trainees. They also visited the Amrita Vidyalayam School and participated in tree planting. We’re looking forward to having Meg Jones back again for a longer visit!

RAHA Gifts Empowered Women!

The RAHA conference kits were handmade with love by women artisans. Hand painted bags, soaps, and woven pouches were some of the high quality products given to registrants.

Champions of Change: Meet Manju Singh

Through our field visits, we meet hundreds of women who inspire and become change makers in their communities. For 2016, we would like to share the story of Manju Singh: the first woman to be elected as the Panchayat village head ‘Mukhiya’. Her humble beginnings included being a star graduate from our Ornamental Jewelry Making course and Tailoring course. She soon demonstrated leadership qualities and headed up an internal committee responsible for taking steps towards community improvement. Later she was responsible for helping villages in Bihar to become Open Defecation Free (ODF). We are proud of you Manju!

Read more about Manju and other inspiring stories of women empowerment Here.
UNISDR Science and Technology Conference
on the Implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030
Jan 27 – 29 UNISDR, Geneva
Prof. Rao R. Bhavani, Director, AMMACHI Labs presented a poster titled “Innovation in Skill Development for The Continuity of Livelihood in Disaster Rehabilitation.” The focus of her presentation was on the 2004 Indian Ocean Tsunami and the response by the Mata Amritanandamayi Math (Embracing the World) in the area of skill development and vocational training. Prof. Rao R. Bhavani was one amongst the 800 eminent scientists, policymakers, practitioners and members of the private sector and civil society from all over the world were in Geneva, Switzerland, to launch the UNISDR Science & Technology Partnership and the Science and Technology Road Map for the implementation of the Sendai Framework for Disaster Risk Reduction. UNISDR was established in 1999 as a dedicated secretariat to facilitate the implementation of the International Strategy for Disaster Reduction (ISDR).

Lumiere Conclave @ Anokha
2016 February 19, Coimbatore
Dr Alexander Muir presented AMMACHI Labs’ Women Empowerment: Sanitation Project at the Lumiere Conclave as part of Amrita University’s ANOKHA Conference. The mission of the Coimbatore campus’ Lumiere is to inspire and enrich the minds of college students at Amrita University, bringing them into conversation with India’s top thinkers from a spectrum of professions. The presentation on our Sanitation project will help inspire Amrita students to use their technological research and inventions for social good, bringing Sustainable Development to India and the world.

Singularity Summit
February 26-27, Mumbai
Professor Bhavani, Director, AMMACHI Labs participated at Asia’s first SingularityU Summit in Mumbai. This two-day conference helps local leaders understand how exponential technologies can be used to create positive change and economic growth in their region.

UNESCO Mobile Learning Week
March 8 – 11, Paris
Prof. Rao R. Bhavani was invited by Dr. Borhene Chakroun, Chief of Section at UNESCO, to share AMMACHI Labs’ experience during an inter-agency workshop on Technical Vocational Education and Training and Gender Equality that was organized on Women’s International Day (March 8th 2016) in UNESCO’s headquarters in Paris. This workshop gathering major institutions such as the ILO, the WHO and the European Commission, among others, aimed at building on the international momentum on these issues and formulate recommendations for the future. Prof. Bhavani was in Paris for duration of the Mobile Learning Week Conference for speaking engagements and knowledge sharing events as well.
The focus of Tech4Dev 2016 was “From Innovation to Social Impact”. Prof. Bhavani and Ajay Balakrishnan shared AMMACHI Labs’ innovative technologies that support social, environmental and economic development in India. One of the outcomes of this conference will be to build partnerships with other organizations, such as NORRAG, the Network for International policies and cooperation in education and training.

On behalf of AMMACHI Labs, Prof. Bhavani attended another International Conference in Geneva on June 22nd. “The Governance of Education and Training: Agenda 2030 and Beyond” was hosted by NORRAG (Network for International Policies and Cooperation in Education and Training) in collaboration with the Education Network of the Swiss Agency for Development and Cooperation in Geneva. NORRAG aims at informing, challenging and influencing policy making and dialogue regarding international perspectives on technical and vocational skills development policies and practice.

Promoting Innovation, Skills and Young Women’s Entrepreneurship
July 15, UN Headquarters in New York

Prof. Rao.R. Bhavani on a panel discussion at the UN Headquarters in NYC on World Youth Skills Day. The theme is “Young Women’s Entrepreneurship, Innovation and Skills Building.”

Prof Bhavani Rao, Director, AMMACHI Labs, Amrita University, said, “There is much debate on what skills are required for the 21st century where education and development are defined and directed by sustainability. Studies conducted by the World Economic Forum show that skill gaps are especially pronounced in low-income countries and recommend the use of technology to overcome these.”
Prof. Bhavani was an invited speaker at the International Workshop on Sensors and Small Satellite Technology for Disaster Management – SSTDM 2016 at the Amrita Institute of Medical Sciences (AIMS). During the morning session: Disaster Management Needs and Challenges Prof. Bhavani presented: "M.A.Math's DRR activities: An Overview."

Organized by the Amrita Center for Wireless Networks, The SSTDM 2016 workshop showcases a concerted effort for identification and further development of mutually agreed small-satellites, sensors, and wireless communication technologies. These envisaged collaborative projects will have innate focus on serving the socio-economic causes and technology-development needs of both the countries with compliance to the existing frameworks.

Amrita University continues to accelerate the adoption of sustainable development, by collaborating with SAARC Countries and Centre on Integrated Rural Development for Asia and the Pacific (CIRDAP), and conducted an expert consultation meeting on "Assessment of role of agro-processing as a key component of rural mass employment and rural development models" at Amrita University, Coimbatore on 18-19 August 2016. The seminar focused on establishing a shared framework for rural development through small-scale agro-business. Members from the Ministries of 10 countries — Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Sri Lanka, Thailand, Malaysia and Indonesia – attended the seminar. Amrita School of Business, Coimbatore hosted the event. More info

Another first for AMMACHI Labs! “Skills in Schools: Computerized Vocational & Life Skills Training For India’s Future Innovators” an E-Learning Initiative of Amrita University and Amrita Vidyalayam Schools was launched today. 190 students over 4 Kerala schools were given training in vocations such as Two Wheeler Maintenance and Fabric painting. Now plans are in place to scale to bring vocational and life skills training to 27 schools across India.
Aswathi P, Research Associate and Amritha N, Embedded Systems Engineer, AMMACHI Labs attended and presented two papers at the 5th International Conference on Advances in Computing, Communications and Informatics (ICACCI’16), Jaipur, India.

The presented papers are: “Bridging the Skill Gap Using Vocational Training Simulators: Validating Skill Assessment Metrics” and “Design and Development of Balance Training Platform and Games for People with Balance Impairments”.

Our PhD scholar Jose James had his paper titled “Bimanual Haptic Simulator for Training Hand palpation and Lumbar puncture” accepted at the Asia Haptics 2016 Conference in Japan. What’s interesting about this conference is that they are very selective about submitted papers that must be supported by live or video demos and is known to be one of the biggest haptics conferences in the world and THE biggest in Asia. Jose is Senior Research Associate at AMMACHI Labs with over 8 years of experience in haptics R&D.

Global Empowerment Summit
La Jolla, California

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Prof. Rao R. Bhavani, Director of AMMACHI Labs, was a panelist and speaker at the Global Empowerment Summit in La Jolla, California. She gave a talk during the session: "Power of Compassion and Global Impact". Br. Dayamrita Chaitanya, Executive Director of MA Centers of North America, lead a guided meditation during a session “Power of Wellness: Group Meditation”. Prof. Karen Moawad of Amrita Center for International Programs – ACIP also participated at the event. The conference explored the power of collaboration, social impact, global connection, human triumph, recognition, and the power of collective minds: human trafficking think tank both locally, nationally, and internationally.

Prof. Bhavani and team members visited the UN-EVOC International Center for TVET (Technical Vocational Education Training) at the UN campus at Bonn, Germany and were hosted by the the Head of UNESCO-UNEVOC: Mr Shyamal Majumdar.

Mr. Majumdar was fascinated by on behalf of Amrita University’s work in the areas of vocational and life skills training in villages and is interested in collaborating to further UNEVOC’s international knowledge sharing network.

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Vatican Youth Symposium to trade knowledge, co-generate ideas and operationalize solutions to achieve Sustainable Development Goals

Vatican, Italy

Young leaders from a variety of disciplines including tech, advocacy, research and policy assembled at the Vatican Youth Symposium to trade knowledge, co-generate ideas and operationalize solutions to achieve Sustainable Development Goals. Sreeram Kongeseri from Amrita University was among 50 youth leaders from more than 30 countries selected to present and deliberate solutions for the realization of SDGs (Sustainable Development Goals).

Sreeram represented India and proposed a solution for achieving SDG 4: Education. His idea was to use game technology to nudge people to become lifelong learners in both formal or non-formal education systems and to learn and apply complex problem solving skills.

Meaningful Play 2016 Conference

Michigan, October 20-22, 2016

Sreeram Kongeseri, a research associate at AMMACHI Labs, designed a participatory process with forty rural participants presented his multi-site case study paper at the Meaningful Play in five village sites across five states in India 2016 Conference held at Michigan State University from October 20-22, 2016. His presentation at MSU was on the use of games for teaching life skills in rural India.

Reaching the Unreached

Skills Development Policies and the Promise of ICT – A Scoping Study from India and South Africa

Researchers Srividya Sheshadri and Chris Coley have been spending time in Europe collaborating with the Managing Director of NORRAG, Mr. Joost Monks, about an 18-month study with the REAL Center at the University of Witswatersrand in South Africa, AMMACHI Labs of Amrita University and NORRAG at the Graduate Institute of International and Development Studies in Switzerland. They plan with the Managing Director of to identify and assess knowledge gaps regarding technical vocational education for unreached populations within India and South Africa.

YWCA International Leadership Institute Experts Group Meeting

Taiwan, Nov 7-11, 2016

AMMACHI Labs Researcher & Technical Manager Prof. Gayathri Manikkutti is attending the YWCA International Leadership Institute Experts Group Meeting in Taiwan. Prof. Gayathri also presented about AMMACHI Labs in the Panel Presentations: Best Practices. Today she will be visiting the Vice President of Taiwan with the delegation.
Articles and Videos

- Who we are 2016 Updated Promo Video
- Effector for the ABB IRB1600 Robot
- Wings: An Awareness Cartoon about Child Sexual Abuse
- Legal Awareness for Women
- Skills in Schools
- Sustainability: A Reality from Policy to Practice
- UNESCO Chair at Amrita University
- A Tree In Your Honor

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