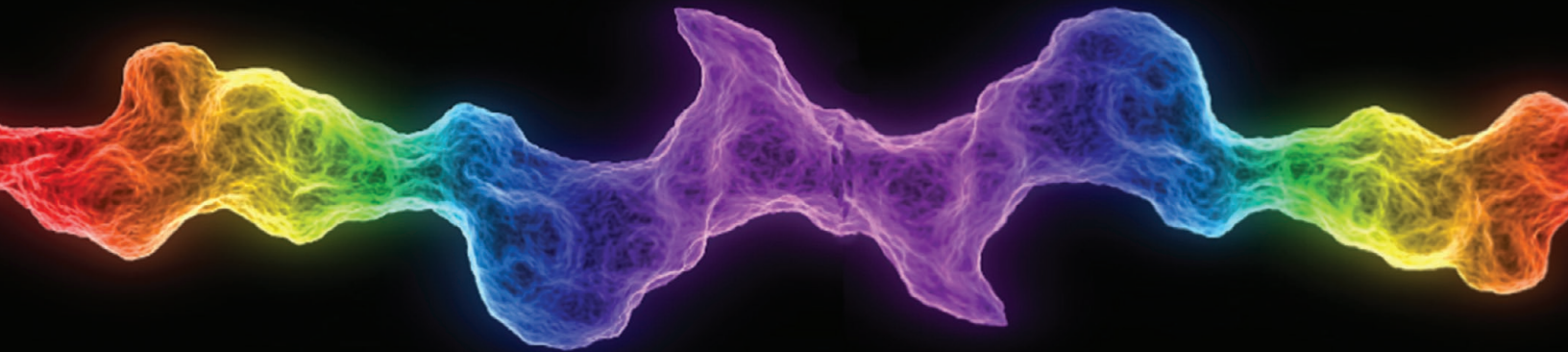




**IEEE Future Directions
Technology Time Machine Symposium
BEYOND TOMORROW**



**31 October - 1 November 2018
San Diego, California, USA**

TTM.IEEE.ORG



2018

BEYOND TOMORROW

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WELCOME TO TTM 2018!



Doug Zuckerman,
TTM 2018 General Chair

It is my great pleasure to welcome you to the IEEE Technology Time Machine conference, **TTM 2018**, here in San Diego, California, USA. In this pleasant setting, you will be able to network with industry leaders, technologists, government officials, economists, and social policymakers from around the world. Over the next two days, we will be embracing the conference theme, *Beyond Tomorrow*, by exploring and showcasing the predicted future and how it impacts today.

This, the fifth Technology Time Machine conference, includes sessions on emerging technologies and developments in neuroscience, the far future, mixed reality and agriculture technology, as well as a presentation on women's roles in making the future. Our three keynote speakers will inform and inspire you. Poppy Crum, Chief Scientist at Dolby Labs, will enlighten us on topics related to the intersection of: human experience, artificial intelligence, sensory data-science, and immersive technologies. Jeff Fedders, Director of Ambient Science Standards for the Next Generation Standards Group at Intel Corporation, and Kati Walcott, who leads the Ambient Science strategy and architecture team in Intel's Data Center Software group, will inform us on new industry initiatives to create the fundamental components of Ambient Science targeting the next societal transformational wave, Society 5.0, a collaboration of Humans and AI.

As we investigate *Beyond Tomorrow*, the conference will examine not only the future but also how future events can affect what we are doing today.

I encourage you to participate in the sessions and network throughout the conference, and I hope you'll take time to enjoy some of the good food and beautiful sights San Diego has to offer.

Once again, welcome to TTM and Beyond Tomorrow!

Douglas N. Zuckerman

General Chair

CONFERENCE DAY ONE

8:30 am – 9 am

OPENING REMARKS

9 am – 10 am

KEYNOTE: AMBIENT WORLD – I AM AWARE...



Jeff Fedders,
Intel



Katalin Bartfai-Walcott,
Intel

10 am – 10:30 am

BREAK

10:30 am – 12 pm

PANEL ON WOMEN MAKING THE FUTURE

Moderated by Dr. Alicia Abella of AT&T, this panel comprises a dynamic set of women who are pioneers and innovators in their fields, which include semiconductor software, wireless power, transportation, edge-computing, and software engineering. The panel's diversity will provide unique and varied perspectives based on their industries, roles, and career background. Their lively discussion will reveal their vision of technological advances expected in the next 30 years and how to capitalize on and evolve with these innovations.



Alicia Abella,
VP, AT&T,
moderator



Katalin Bartfai-Walcott,
Intel



Mary Gendron,
Qualcomm



Christine Miyachi,
Xerox



Jeewika Ranaweera,
Oracle

12 pm – 1:30 pm

LUNCH



Norman Shaw,
IEEE Standards Association

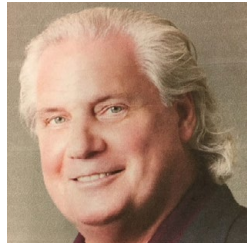
1:30 pm – 3:00 pm

FAR FUTURES

The Far Futures panel, as its name indicates, has a long-term perspective that covers a range of future scenarios that will stimulate questions to ask at the Q&A session and ideas to develop long after the TTM 2018 Conference. Topics include the ongoing evolution of Artificial Intelligence and human/machine symbiotic intelligence, the latest stages in the development of a hippocampal neural prosthesis, using Artificial Intelligence to discover and optimize supermaterials to identify potential next-generation alloys, and current and future cyber-physical systems in which humans and other life forms interact closely with engineered systems.



Stuart Mason Dambrot,
moderator



Ted Berger,
University of Southern California



Karin Hollerbach,
Cyber-Physical Systems R&D and Deployment



Conrad Rosenbrock,
Tracy Inc., Brigham Young University



Roberto Saracco,
EIT Digital

3 pm – 3:30 pm

BREAK

3:30 pm – 5 pm

NEUROSCIENCE AND BRAIN

One vision of future human-computer interaction focuses on developing a direct communication channel between brain activity and machines. It is believed that technology enabling such communication and control would be a next step in “human driven evolution” that improves our ability to process information, make decisions, recover from disease and disability and dramatically improve our quality of life. However this vision also forces us to confront several moral and ethical dilemmas and should invite pause as we understand its philosophical, societal, and legal implications. In this panel we will hear about the technology roadmap for interfacing with the brain as well as discuss the ethical implications of its potential use in enabling brain-computer and brain-machine interfaces.



Paul Sajda,
Columbia University,
moderator



Matthew Angle,
Paradromics



Christopher Guger,
g.tec



Laura Specker Sullivan,
College of Charleston

CONFERENCE DAY ONE

5 pm – 6:30 pm

AGRICULTURAL FOOD SYSTEMS

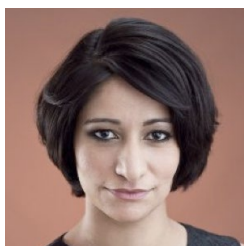
How will technology impact our food systems in the future? This panel will address how high tech innovations can improve the quality of food and reduce the global environmental impact of the agricultural industry. Discussions will include advancements such as deep learning for autonomous food inspection for both quality control and reduction of waste; IoT in agriculture for water management, field, crop and soil monitoring; smart packaging; domestic and global public health issues impacted by technology; and blockchain use in agriculture and health. Learn how the food you ingest Beyond Tomorrow will be enhanced through the implementation of leading-edge discoveries.



Upkar Dhaliwal,
moderator



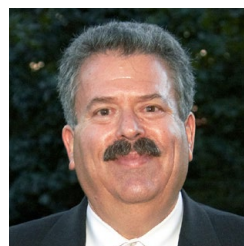
Derek Footer,
HardTech Labs, CEO



Miku Jha,
AgShift, CEO



Tim Mackey,
University of
California San Diego,
Global Health Policy
Director



Bernie Meyerson,
IBM, Chief
Innovation Officer



John Verboncoeur,
Michigan State
University,
IEEE AgTech Adhoc
Chair

6:30 pm +

RECEPTION / DINNER — IEEE HKN IGNITE WITH A TWIST TALKS

8:30 am – 9 am

RECAP OF DAY 1



Roberto Saracco

9 am – 10 am

KEYNOTE



Poppy Crum,
Dolby Laboratories

10 am – 10:30 am

BREAK

CONFERENCE DAY TWO

10:30 am – 12 pm

YOUNG ENTREPRENEURS AND IEEE N3XT®

IEEE N3XT® discussions are focused on bringing skills and inspiration to the next generation of entrepreneurs. Hear from founders and investors engrossed in the world of engineering driven entrepreneurship with a focus on data storage, semi-conductors, aerial robotics, brain computer interfaces, and healthcare on merging frontier technology with founding companies.



Rakesh Kumar,
TCX Technology
Connexions,
moderator



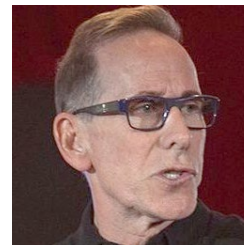
Ganesh Subramanian,
Panimalar Institute
of Technology



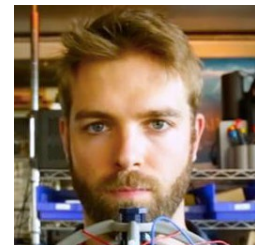
Tom Coughlin,
Coughlin
Associates, Inc.



Colin Curtin,
Human Interest



Greg Horowitz,
T2 Venture Capital



Conor Russomanno,
Meta

12 pm – 1:30 pm

LUNCH

1:30 pm – 3 pm

MIXED REALITY

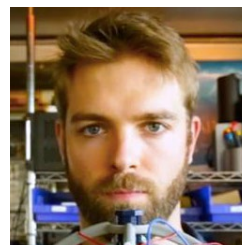
What world will you live in beyond tomorrow? Interact with innovative speakers from Xmark Labs, Meta, and J&J addressing their work on providing real world advantage from virtual world technologies and blockchain, development of AR hardware and software, mixed reality for healthcare, and the policy and ethical implications of AR/VR. The engaging conversation between the audience and these reality experts will be unreal.



Raj Tiwari,
Johnson & Johnson,
moderator



Nicholas Napp,
Xmark Labs, LLC



Conor Russomanno,
Meta

3 pm – 3:30 pm

BREAK

3:30 pm – 5 pm

DISTINGUISHED EXPERTS PANEL

How will technology impact our lives today, tomorrow, and beyond tomorrow? Experts will focus on how our lives will be different due to advances in science and engineering fields including energy efficient communication networks, Artificial Intelligence (AI), autonomous and intelligent systems, VR/AR, connected devices and more. This panel will offer lively discourse on these topics and will provide opportunity for audience engagement and questions regarding the current and future implementations of technological advances for the benefit of humanity.



Celia Desmond,
Echologics and
World Class –
Telecommunications,
moderator



Sean White,
Mozilla



Jaafar Elmirghani,
University of Leeds



Jeff Fedders,
Intel



Steve Welby,
IEEE

5 pm – 5:30 pm

CLOSING REMARKS

ORGANIZING COMMITTEE



Doug Zuckerman,
TTM 2018 General
Chair



**Mahmoud
Daneshmand,**
TTM 2018 Program
Co-Chair



**Stuart Mason
Dambrot,**
TTM 2018 Program
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Celia Desmond,
TTM 2018 DEP Chair



Tom Coughlin,
President Elect,
IEEE-USA



Upkar Dhaliwal,
IEEE TTM 2018
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Stephen L. Diamond,
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Committee Chair



Kathy Grise,
Senior Program
Director – IEEE
Future Directions



Bichlien Hoang,
IEEE Senior Member



Kathleen Kramer,
Professor, Electrical
Engineering,
University of
San Diego



Rakesh Kumar, PhD,
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Fabrizio Lombardi,
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Professor,
Northeastern
University, Boston



Christine Miyachi,
Xerox



Roberto Saracco,
IEEE Symbiotic
Autonomous
Systems Chair



Rajiv Tiwari (Raj),
Johnson & Johnson



Bill Tonti,
Director, IEEE
Future Directions



Yu Yuan,
Founder, CATE Global
and CEO, Motiveware
Technology

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Inventing technology is just one of the ways we change lives.

If you want to create technological breakthroughs and improve lives everywhere, you need as many brilliant ideas as possible. That's why we're a proud supporter of the IEEE Technology Time Machine Conference. Thank you for helping make the world better, and smarter.

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IEEE Future Directions identifies and promotes projects relating to cutting-edge technologies in order to advance discussion and to provide a deep and broad perspective throughout IEEE and beyond. It is the goal of IEEE Future Directions to educate, facilitate standards, and coordinate technical roadmaps, relying on the passion and dedication of global IEEE volunteers.

Special thanks to the following initiatives for their contributions to the outstanding IEEE TTM 2018 program:



Technical Sponsor of the Neuroscience and Brain Panel



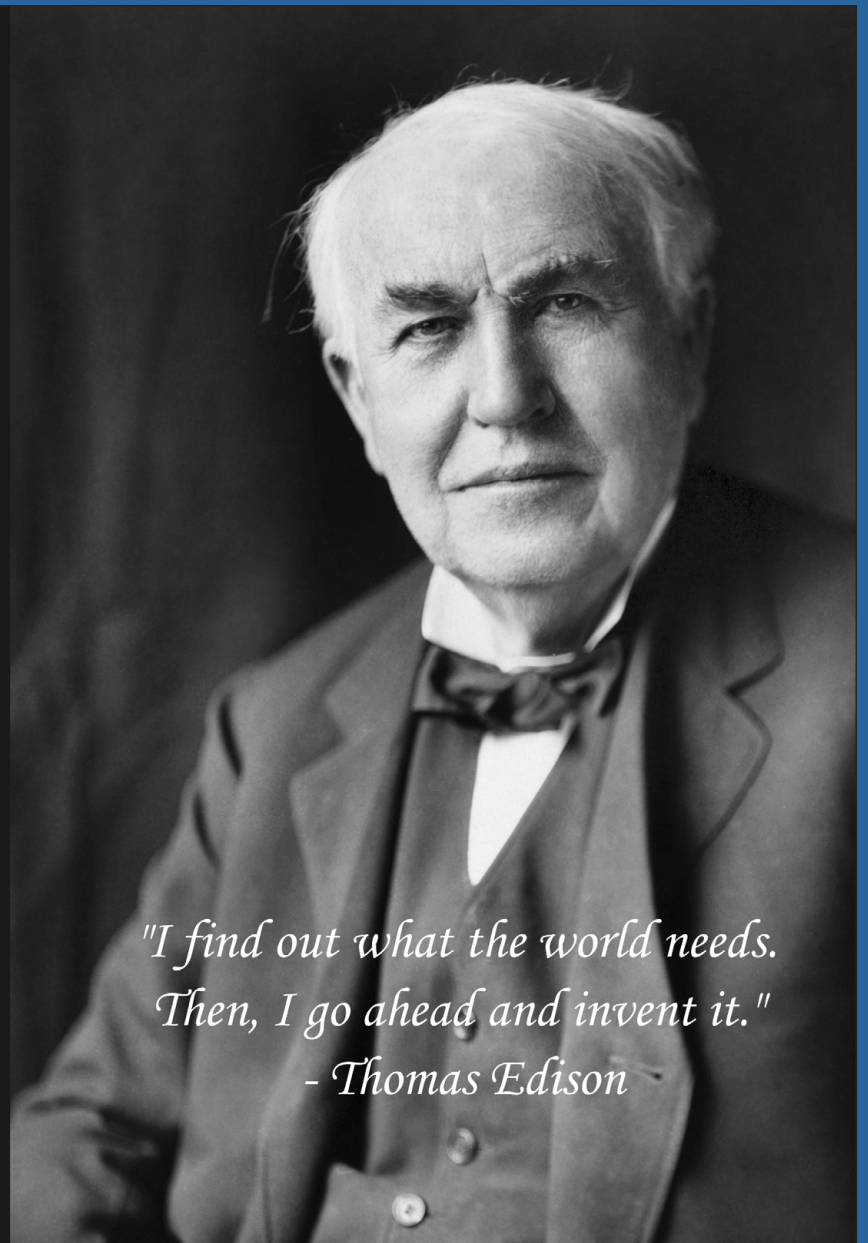
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Initiative Co-Chair featured on Distinguished Experts Panel



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Then, I go ahead and invent it."
- Thomas Edison*

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