

MEDIA ALERT

**TRANSFORMATIVE, EMERGING TECHNOLOGIES TABLED FOR DISCUSSION IN SINGAPORE**

26 November 2013 – SINGAPORE – One of the most extraordinary science and technology events to be held in Singapore, MIT Technology Review’s EmTech Singapore, will be held at the Sands Expo and Convention Centre - Marina Bay Sands, 20-12 January, 2014. Doctors, Researchers, Businessmen and Scientists from a wide range of industries and research fields will convene in Singapore to discuss the latest trends in emerging technologies.

On the table for discussion:

* how **innovative data-crunching** or the application of purely functional paradigms to code, infrastructure and the collection of data are enabling the rapid development of powerful, reliable, and scalable programs to transform businesses as diverse as hospitals, retailers and even urban cities;
* the synthesis of engineering and biology and its potential impact on **green chemicals**, or to develop **sustainable and renewable resources**
* innovations in **medical technology** from using retinal scans as a diagnostic tool for life threatening conditions and how each of us is likely to experience robotic assisted surgery
* **re-imagining the assembly of our physical world** by using developments in nanotechnology, synthetic biology and biomedical science to create radical **4D printing solutions** at much larger scales that feature self-assembly and programmable matter
* **the use of robotics in environmental stewardship** – using air and ground systems to detect invasive weeds and pests, animal tracking, or farm crop yield and health management
* the transformation of architecture through **digital materiality** and how the ideas of architects in the future will permeate the fabrication process of buildings in their entirety
* building new models for **urban infrastructure development** that address existing ones with transformative ideas, in a manner that accelerates funding and stakeholder approvals, so as to prepare cities to cope with explosive urban population growth
* the exploration of **autonomous driving technology and future urban mobility** both from a macro regulatory standpoint and the call for start-ups to disrupt the industry by applying new technology, patterns of thinking and lean methodology

Rarely do such speakers come under one roof. Speakers such as **Jeff Hammerbacher**, Founder and Chief Scientist of Cloudera; **Skylar Tibbits**, Director of the Self-Assembly Lab at MIT; **Salah Sukkarieh**, Director of Research & Innovation at the Australian Centre for Field Robotics; **Fabio Gramazio**, an Architect with ETH; **Amar Hanspal**, Senior Vice President, Autodesk and **Emilio Frazzoli**, the Lead Principal Investigator of Future Urban Mobility for Singapore-MIT Alliance for Research and Technology (SMART) Centre.

The deadline for early bird registrations is this Friday, 28 November. Media are welcome to register. To learn more about EmTech Singapore, visit emtechsingapore.com.

- ENDS -

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NOTES TO EDITORS:

The following information details the speakers for, and content to be discussed, at EmTech Singapore.

BIG DATA

**Jeff Hammerbacher**, Founder and Chief Scientist, Cloudera and the Former Head- Data Science Team, Facebook will lead discussion on innovation in Big Data. He will discuss how to deliver value through innovative data-crunching. Jeff illustrate this by presenting an overview of how data is generated, collected, and analyzed within the hospital and medical school at Mount Sinai Hospital in Manhatten, New York.

**Corentin Roux Dit Buisson**, Senior Vice President of Business Intelligence and Head of Data Science for the retail giant Zalora will present how Zalora's data science team applies the purely functional paradigm to its code, infrastructure and data to enable the rapid development of powerful, reliable, and scalable programs for all business units.

**Ng See Kiong**, Program Director, SERC Urban Systems Initiative, A\*STAR will discuss how Big Data is a game-changer for building better cities. He argues that today, a city’s heartbeat can increasingly be found in the massive amounts of data that it generates -- from sensors in smart buildings and moving vehicles to human tweets in the social media, all in real-time. This new abundance of urban data can be a game-changer for building better cities, if we can make the data work for the city using intelligent and scalable data analytics.

GREEN CHEMICAL REVOLUTION

**Charles Cooney**, Faculty Director, Desphande Center for Technological Innovation at MIT will address the ultimate impact of the green chemical revolution and beyond by asking the question, “*What limits the implementation”.* He sees that successful delivery of this vision must have an emphasis on the convergence of engineering and biology.

What does it take to engineer “Lego blocks of life” for the production of sustainable and renewal bio-resources? **Too Heng Phon**, Associate Professor, Department of Biochemistry of NUS will talk about how the rapidly emerging fields of synthetic biology and metabolic engineering are bringing about the willful design and construction of novel artificial biological mechanisms to achieve desired cellular behaviors – and how this has provided an unprecedented opportunity to develop sustainable and renewable resources.

MEDTECH

**Wong Tien Yin**, Group Director of Research for SingHealth will present information on how scans of retinal blood vessels can be used to predict stroke and heart diseases. Clinical studies have proven that a range of retinal vascular changes, measured quantitatively with computer software, are predictive of vascular diseases before they become clinically symptomatic. For example, narrower retinal arteries are associated with subsequent development of hypertension and diabetes, while wider retinal veins are associated with the development of stroke events and stroke deaths. The predictive nature is independent of a person’s traditional risk profile (e.g., the age of the patient and cigarette smoking status) and therefore, he argues, that a digital retinal scan offers the potential to screen and risk stratify a person’s probability of developing major life threatening conditions, years before these conditions develop.

4D PRINTING

**Skylar Tibbits**, Director of the Self-Assembly Lab at MIT will demonstrate why he thinks that the making of our human-scale world is outdated, energy intensive, error-prone and inefficient and how an opportunity has emerged to revolutionize the assembly of our physical world. From recent developments in nanotechnology, synthetic biology and the biomedical industry, the phenomena of self-assembly and programmable matter offers radical solutions at much larger scales. Self-assembly is a scale-independent technology that allows components to come together on their own and transform shape or property for highly efficient and programmably adaptive systems. The combination of additive manufacturing and programmable materials, or 4D Printing, offers one technological solution for the smart assembly of our future world.

ROBOTICS

*Environmental stewardship*

**Salah Sukkarieh**, Director of Research & Innovation at the Australian Centre for Field Robotics will present on the potential of robotics and intelligent systems to support environmental stewardship. He says that this field has come about because of three influences:

* the availability of technology at lower costs thus making it easier for environmental agencies and managers to gain access to these systems;
* the ever increasing demand and focus on sustainability; and
* greater information requirements and complexity surrounding land management.

The island nature of Australia has brought about the need – to combat invasive species, manage rare species, deal with an increasing demand on inputs and outputs of farm land – so the value of nutrition to society takes upmost importance. Salah will present a range of projects using robotic air and ground systems for supporting environmental stewardship, including systems used to detect invasive weeds and pests, animal tracking, and farm robots for crop yield and health management.

*Robotic Surgery*

**Casey Chan**, a Partner in Venture MD, argues that as there is a 35% chance that you will need one or more major surgeries in your lifetime; these surgeries are increasingly likely to be robotic assisted. Dr. Chan will explore the future of robotic surgery from the perspective of a patient, a surgeon and an engineer. At EmTech Singapore, Casey will review the current state of “robotic” surgery and discuss his attempts to identify emerging innovations that will shape the future of surgery.

DIGITAL MATERIALITY

**Fabio Gramazio**, an Architect with ETH, will speak on the topic of Digital Materiality, a term describing an emergent transformation in the expression of architecture. Materiality is increasingly being enriched with digital characteristics, which substantially affect architecture’s physis. Digital materiality evolves through the interplay between digital and material processes in design and construction. The synthesis of two seemingly distinct worlds – the digital and the material – generates new, self-evident realities. Data and material, programming and construction are interwoven. This synthesis is enabled by the techniques of digital fabrication, which allows the architect to control the manufacturing process through design data. Material is thus enriched by information; material becomes “informed.” In the future, architects’ ideas will permeate the fabrication process in its entirety. This new situation transforms the possibilities and thus the professional scope of the architect.

FUTURE CITIES

*New models of urban development*

**Ryan Chin**, Managing Director of the City Science Initiative at the MIT Media Lab will explore

non-incremental and disruptive urban innovations in the areas of mobility, energy, housing, and food production systems that move beyond augmenting existing city infrastructure with digital information systems. The massive problems associated with rapid urbanization, such as congestion, energy inefficiency, and pollution leading to climate change, particularly in developing economies, demands entirely new models of urban development. The City Science Initiative at the MIT Media Lab has developed new technologies, strategies, and designs to address this need. Innovations to be discussed include autonomous mobility-on-demand systems, transformable live/work spaces, façade-integrated aeroponic systems, resilient energy networks, and the design of compact urban cells -- a high-density live/work neighborhood where 80% of what most people need are within a 20-minute walk.

*Confronting the urban infrastructure cliff*

**Amar Hanspal**, Senior Vice President, Autodesk is not afraid to confront the “Urban Infrastructure Cliff”. He says that far from the attention getting big new infrastructure projects is the pressing problem of outdated, even crumbling infrastructure that needs to be dramatically upgraded, expanded and made "smarter" to support economic and population growth. As the world's urban population grows from 50% in 2008 to as much as 85% of the projected 9 billion people in 2050, existing urban infrastructure needs to be addressed urgently, but lack funding and consensus. McKinsey estimates that of the $60T needed in infrastructure investment worldwide by 2030, more than half - $36T – is unfunded. Autodesk are creating new tools that dramatically accelerate the planning, design, visualization and simulation process for infrastructure to accelerate funding and stakeholder approvals. At EmTech Singapore, Amar will look at how urban infrastructure is being radically reshaped for the 21st century — both in how it's designed using "big data" and how it's being built to be smarter and greener for a much more densely urban world.

FUTURE MOBILITY

*Autonomy and Future Urban Mobility*

**Emilio Frazzoli**, the Lead Principal Investigator of Future Urban Mobility for SMART says that research and development on autonomous driving technologies is progressing at a rapid pace, in industry and academia. Yet evaluation of the social and economic impacts of these technologies is difficult, as is the development path towards what is often referred to as “full autonomy.” At EmTech Singapore, Emilio will present results of a case study, based on data collected in Singapore, on the impact of autonomous cars as an enabling technology for widespread vehicle sharing, a vision combining the convenience of private car ownership with the sustainability of public transportation. This study highlights challenges and opportunities for the automotive industry and for government regulators in embracing these new technologies.

*The Financial Perspective on Self Driving Cars*

**Daniel Morton**, a Business Analysis Associate with SMART believes that while discussion occurs around the engineering challenges, liability concerns and policy issues regarding Self Driving Cars, more attention needs to be placed on the financial impact of Self Driving Cars. At EmTech Singapore, Daniel will identify and explore some of the major issues on this topic from a financial perspective.

*Running a Technology Start-up in the Transportation Sector - Crazy or Visionary?*

**Tom Lokenvitz**, the Director of sMOVE believes that the transportation sector has been dominated by government planning, big corporations and massive infrastructure projects. He believes that start-ups need to disrupt the sector by applying a combination of new technology, the fail-fast/ fail-quick approach with lean start-up methodology. At EmTech Singapore, Tom will talk about his experience at sMove - a real life example from Singapore.