SUTD-MIT INTERNATIONAL DESIGN CENTRE (IDC)

Innovation Ready Design

7th SUTD-MIT IDC DESIGN SUMMIT

14 - 15 JANUARY 2019

MAX Atria, Singapore Expo

"Reimagining Climate Futures"

Proudly supported by:

SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN

Massachusetts Institute of Technology

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Welcome to the 7th SUTD-MIT IDC Summit!

We would like to thank you for your presence at and participation in the 7th annual Design Summit, organized by the SUTD-MIT International Design Centre (IDC). As in previous years, the Summit is a meeting place to establish and deepen relationships among SUTD and MIT faculty, research and students and the many participants from other academic institutions, government organisations and industry.

This year's theme is "Reimagining Climate Futures". To quote the Deputy Prime Minister of Singapore, Mr Teo Chee Hean: "Climate change is not only about challenges and constraints; it also provides strong incentives for entrepreneurship, research and development, and creative problem-solving". We believe that it is our responsibility as a community aimed at design for a better world, to join forces in addressing the greatest challenge the world is currently facing, climate change.

We are looking forward to two days of Keynote presentations, a panel discussion, elevator pitches and posters showcasing the exciting activities of our researchers, and two workshops to discuss the role of design for climate change. We have organized the Summit to also create ample opportunities for discussions and networking.

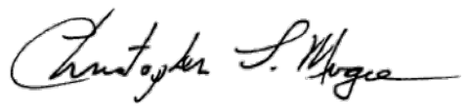
This year we have the honor and privilege to have the Chairman of the Lee Kuan Yew Centre for Innovative Cities and former Singapore Ambassador to the USA, Prof Chan Heng Chee, open the Summit.

We are fortunate to welcome two renowned keynote speakers and colleagues Professor John Fernandez, Director of MIT's Environmental Solutions Initiative, and Professor John Moore, a specialist in Glaciology and Climate Research, including Geoengineering at Beijing Normal University and the University of Lapland. They will share their unique perspective and work on "Design for Climate Change".

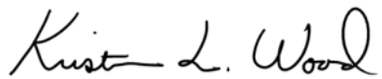
We are looking forward to working with you during this Summit! We hope it will be thought provoking and insightful; we trust it will lead to new and exciting collaborations and great projects for the future of IDC and the future of the climate.

Sincerely yours,

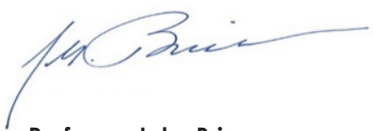
Professor Lucienne T.M. Blessing
IDC Co-Director (SUTD)



Professor Christopher L. Magee
IDC Co-Director (MIT)



Professor Kristin L. Wood
IDC Co-Director (SUTD)



Professor John Brisson
Director, MIT-SUTD
Collaboration Office

About SUTD-MIT IDC Design Summit

The IDC Design Summit is held in January each year to bring together SUTD and MIT Principal Investigators (PI), researchers, students and external partners from the industry academia and government organisations in Singapore.

Our objective is to create an opportunity for all to share their work, ideas and vision, but also to foster collaboration within the IDC and with our external partners. Each year, the IDC Summit has a strategic theme, chosen to help guide discussions about the IDC future direction. This year, we have chosen "Reimagining Climate Futures". With the latest IPCC report issued in October 2018 and the COP24 organized this year in Poland, not a week passes without news about our climate. And the news is not good. We believe that it is our collective responsibility to come together as a community and discuss what solutions we can design to address this challenge.

Day 1 will start with an introduction by the Chairman of the Lee Kuan Yew Centre for Innovative Cities, Professor Chan Heng Chee, sharing with us her view on the effects of climate change on cities. This is followed by a presentation of the current state of the IDC and the post-2020 vision for the IDC. Since its inception, 8 years ago, the IDC's researchers have generated over 2450 publications, 319 awards and accolades, 69 Intellectual Property (IP) including patents, and over 275 grants totalling more than S$142 millions of leveraged funding.

Professor John Fernandez will be our first keynote speaker, sharing his perspective on "Design for (and in) a changed climate".

A speed networking session provides an opportunity for networking within the community and sow the seeds for new collaborations. This followed by the first of two workshops. Workshop 1, "Climate Change: a systems design challenge to be understood", aims at understanding the climate as a complex geo-socio-technical system impacted by a variety of factors. The day closes with a presentation of workshop results.

Day 2 will start with a presentation of our second distinguished keynote speaker Professor John Moore on "Conserving the planet: what role for targeted geoengineering to mitigate deleterious climate change?". A panel discussion among our speakers and some distinguished guests will provide different perspectives on whether and how design can impact climate change.

After the break, a team of MIT and SUTD students will present the results from a one-week COOL-Hackathon. We are looking forward to see their creations!

The afternoon is dedicated to Workshop 2, "Climate Change: radical socio-technical design required" in which we explore a few climate change challenges in more depth, and encourage each participant to reflect on how they can leverage their particular area of expertise to address the challenge. The objective is to produce ambitious interdisciplinary project ideas that go beyond each individual area of research to tackle the climate as a complex system.

During the 2 days, there will be dedicated sessions for elevator pitches from our faculty, researchers and students as well as a poster exhibition showing exciting achievements and contributions to research, education and practice.

We hope you will enjoy and be inspired by this year's Summit!

About the Singapore University of Technology and Design (SUTD)

The Singapore University of Technology and Design is established to advance knowledge and nurture technically-grounded leaders and innovators to serve societal needs, with a focus on Design, through an integrated multi-disciplinary curriculum and multi-disciplinary research.

Technology and design always have been and always will be essential for society's prosperity and well-being.Embracing this tenet as a call to action, SUTD will be a leading research-intensive global university focused on technology and all elements of technology-based design. It will educate technically-grounded leaders who are steeped in the fundamentals of mathematics, science, and technology; are creative and entrepreneurial; have broad perspectives informed by the humanities, arts and social sciences; and are engaged with the world. It will embrace the best of the East and West and drive knowledge creation and innovation, as well as innovative curriculum and teaching approaches.

Its faculty, students and staff will have far-reaching aspirations to create a better world by design, the confidence and courage to try new ideas and approaches, a questioning spirit fueled by the thrill of multi-disciplinary learning and doing, and life-long competencies, especially the ability and appetite to learn and innovate. By excelling in all these dimensions, SUTD will be viewed as the foremost university in the world for technology and design education and research.

About the SUTD-MIT International Design Centre (IDC)

The SUTD-MIT International Design Centre (IDC) is a world premier scholarly hub for technologically-grounded design. IDC faculty, researchers and students study and advance the design process and design science, and develop new tools and methods for design practice and education to address the strategic needs of Singapore and the global community. At the same time, the IDC studies and advances the design process and design science, seeking to develop new tools and methods for design practice and education. The IDC is organised and concentrates its efforts on three Grand Challenges: Sustainable Built Environment, Design with the Developing World, and ICT-enabled Devices for Better Living, in conjunction with six Design Research Thrusts: Experimental Design, Fostering Creativity, Visualisation and Prototyping, Design Computation, Decision Making, and Global Collaboration.

About the Massachusetts Institute of Technology (MIT)

Massachusetts Institute of Technology

The mission of the Massachusetts Institute of Technology is to advance knowledge and educate students in science, technology, and other areas of scholarship that will best serve the nation and the world in the 21st century. We are also driven to bring knowledge to bear on the world's great challenges.

The Institute is an independent, coeducational, privately endowed university, organized into five Schools (architecture and planning; engineering; humanities, arts, and social sciences; management; and science). It has some 1,000 faculty members, more than 11,000 undergraduate and graduate students, and more than 130,000 living alumni.

At its founding in 1861, MIT was an educational innovation, a community of hands-on problem solvers in love with fundamental science and eager to make the world a better place. Today, that spirit still guides how we educate students on campus and how we shape new digital learning technologies to make MIT teaching accessible to millions of learners around the world.

MIT's spirit of interdisciplinary exploration has fueled many scientific breakthroughs and technological advances. A few examples: the first chemical synthesis of penicillin and vitamin A. The development of radar and creation of inertial guidance systems. The invention of magnetic core memory, which enabled the development of digital computers. Major contributions to the Human Genome Project. The discovery of quarks. The invention of the electronic spreadsheet and of encryption systems that enable e-commerce. The creation of GPS. Pioneering 3D printing. The concept of the expanding universe.

Current research and education areas include digital learning; nanotechnology; sustainable energy, the environment, climate adaptation, and global water and food security; Big Data, cybersecurity, robotics, and artificial intelligence; human health, including cancer, HIV, autism, Alzheimer's, and dyslexia; biological engineering and CRISPR technology; poverty alleviation; advanced manufacturing; and innovation and entrepreneurship.

MIT's impact also includes the work of our alumni. One way MIT graduates drive progress is by starting companies that deliver new ideas to the world. A recent study estimates that as of 2014, living MIT alumni have launched more than 30,000 active companies, creating 4.6 million jobs and generating roughly $1.9 trillion in annual revenue. Taken together, this "MIT Nation" is equivalent to the 10th-largest economy in the world!

Venue

Inspired by nature and Earth's natural elements, MAX Atria is the first MICE facility in Singapore to receive the Building and Construction Authority Green Mark Platinum standard for its green initiatives and eco-friendly building design. This unique space is surrounded by lush gardens, stimulating scent as well as soundscapes, evoking a sense of well-being that is complemented by the natural daylight streaming into the building.

MAX Atria, Singapore Expo
1 Expo Drive
Singapore 486150

By MRT

A direct, more convenient way to arrive at Singapore EXPO is through the Downtown Line. It now takes only 30 minutes from CBD areas such as Clarke Quay, Marina Bay and River Valley. If you are coming from other parts of Singapore, transfer at Tanah Merah MRT Station (EW4), from there the train will take you to Expo MRT in 3 minutes.

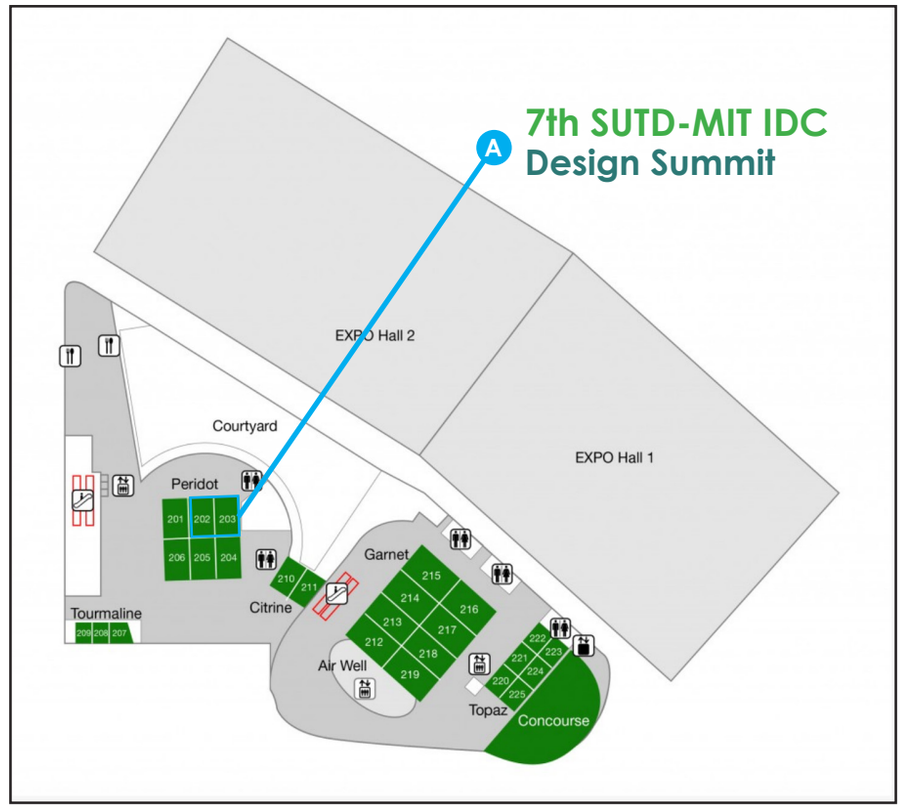
By Taxi

There are numerous taxis available in Singapore that offer reliable service. The taxi fare from the airport to MAX Atria is about S$15 and to the city about S$20, subject to surcharges.

By Car

Situated at the crossroads of 3 main expressways – East Coast Parkway, Pan Island Expressway and Tampines Expressway, MAX Atria is a mere 15-minute drive from the CBD and a 5-minute ride to Changi International Airport.

Location Map



Legend:

A - Level 2, Peridot 202 & 203
Address: 1 Expo Drive, Singapore 486150

Credit: MAX Atria

7th SUTD-MIT IDC Design Summit

MAX Atria, Singapore Expo,Level 2, Peridot 202-203, 1 Expo Drive, Singapore 486150

14 - 15 JANUARY 2019

"Reimagining Climate Futures"

Day 1 : Monday, 14 January

08:00	Arrival and Registration (breakfast will be provided) + Visit Posters
09:00	Welcome and Introductory Remarks (Prof Chan Heng Chee)
09:30	State of the IDC
10:15	IDC Post 2020
10:45	Break + Visit Posters
11:00	Keynote - Design for (and in) a changed climate (Prof John Fernandez)
12:00	Elevator Pitches of Research Projects
12:30	Lunch (provided) + Visit Posters
13:30	Speed Networking (Speed Dating)
14:15	Introduction to Workshops
14:30	Workshop Session #1: Climate Change: a systems design challenge to be understood (Moderator Prof. Lakshminarayanan Samavedham)
16:45	Presentation of results
17:15	Close of Day 1

Day 2 : Tuesday, 15 January

08:30	Breakfast (Provided) + Posters Visit
09:00	Keynote - Conserving the planet: what role for targeted geoengineering to mitigate deleterious climate change? (Prof John Moore)
10:00	Panel Discussion on The role of design in addressing climate change
11.00	Break + Visit Posters
11:15	COOL-Hackathon
12:00	Elevator Pitches of Research Projects
12:30	Lunch (Provided) + Visit Posters
13:30	Workshop Session #2: Climate Change: radical socio-technical design required
15:00	Break + Visit Posters
15:15	Summary and Synthesis of Workshop Results
16:00	Wrap Up: Concluding Remarks
16:30	Close of Day 2

Welcome and Introductory Remarks

PROF. CHAN HENG CHEE

AMBASSADOR-AT-LARGE AT SINGAPORE FOREIGN MINISTRY AND CHAIRMAN OF THE LEE KUAN YEW CENTRE FOR INNOVATIVE CITIES, SUTD

Professor Chan Heng Chee is currently Ambassador-at-Large with the Singapore Foreign Ministry and Chairman of the Lee Kuan Yew Centre for Innovative Cities, SUTD. She is Chairman of the National Arts Council and a Member of the Presidential Council for Minority Rights.

Professor Chan served as Singapore's Ambassador to the United States 1996-2012, Singapore's Permanent Representative to the United Nations 1989-1991, and was concurrently High Commissioner to Canada and Ambassador to Mexico.

She has received Honorary Degrees from the University of Warwick, the University of Newcastle (Australia), and the University of Buckingham. She holds a B.Soc.Sc (Hons) First Class from the National University of Singapore, a M.A. from Cornell University and a Ph.D from the University of Singapore.

Keynote Talk

DESIGN FOR (AND IN) A CHANGED CLIMATE

Monday, 14 January, 11.00am

Abstract

The climate is now changing in ways that are measurable and consequential. Over time climate change will, by some accounts, change everything. The new era of the Anthropocene is now the context within which all manner of design exists, proceeds and evolves. Fernandez will address two key questions; In what ways can design bring solutions to our climate dilemma, and How does climate change affect design? Through a survey of the state of knowledge on the rate and nature of climate changes, Fernandez will highlight opportunities in which design can contribute to mitigating greenhouse gas emissions, provide adaptation strategies, and illuminate pathways toward repairing damage to earth's systems.

PROF. JOHN FERNANDEZ

PROFESSOR AND DIRECTOR OF THE BUILDING TECHNOLOGY PROGRAM IN THE DEPARTMENT OF ARCHITECTURE AND DIRECTOR OF THE URBAN METABOLISM GROUP AND CO-DIRECTOR OF THE INTERNATIONAL DESIGN CENTER AT MIT

Professor John E. Fernández, class of 1985, has been on the faculty of MIT since 1999. He is a full Professor and Director of the Building Technology Program in the Department of Architecture and is Director of the Urban Metabolism Group, a highly multidisciplinary research group focused on the resource intensity of cities and design and technology pathways for future urbanization. He is also co-Director of the International Design Center at MIT, a large internationally funded center for design studies across engineering and architecture.

He is author of two books, numerous articles in scientific and design journals including Science, the Journal of Industrial Ecology, Building and Environment, Energy Policy and others, author of nine book chapters and a frequently invited speaker at conferences and symposia worldwide. He has organized, chaired or co-chaired 7 international conferences. He is Chair of Sustainable Urban Systems for the International Society of Industrial Ecology and Associate Editor of the journal Sustainable Cities and Society.

Keynote Talk

CONSERVING THE PLANET: WHAT ROLE FOR TARGETED GEOENGINEERING TO MITIGATE DELETERIOUS CLIMATE CHANGE?

Tuesday, 15 January, 9.00am

PROF. JOHN MOORE

CHIEF SCIENTIST, COLLEGE OF GLOBAL CHANGE AND EARTH SYSTEM SCIENCE, BEIJING NORMAL UNIVERSITY AND PROFESSOR OF CLIMATE CHANGE, ARCTIC CENTRE, UNIVERSITY OF LAPLAND

Abstract

Dangerous human-induced climate warming is underway. If we stop all greenhouse gas emissions today the climate will still warm and the oceans will still rise. The greenhouse gases already in the atmosphere have a long residence time and critical thresholds in the Earth's natural systems have been crossed. Geoengineering is deliberate human intervention to counter warming and sea level rise. For example, engineering projects to stabilise the Antarctic Ice sheet. This is a proposal for research, it is neutral about the findings. That is the research may show that doing geoengineering is worse than living with greenhouse gases alone. This is a very interdisciplinary subject area covering the natural sciences (impacts of geoengineering and likely success against climate change), engineering (feasibility and implementation) and social sciences and law (international governance of such schemes).

John Moore, British, Research Professor at University of Lapland, Finland and Chief Scientist, GCESS, Beijing Normal University. Awarded China Friendship medal 2014. Chief scientist on 2007-2009 International Polar Year project: Kinnvika. Member of World Meteorological Organization (WMO) advisory panel on Geoengineering. Steering committee member World Climate Research Program (WCRP), Geoengineering Model Intercomparison Project (GeoMIP). Finnish representative on International Arctic Science Committee (IASC) Glaciology Network. Member/leader of 6 Antarctic, 4 Greenland and 20 Svalbard expeditions and various others in Scandinavia, Alaska, Iceland and High Mountain Asia.

7th SUTD-MIT IDC Design Summit

Workshop 1

CLIMATE CHANGE:
A SYSTEMS DESIGN CHALLENGE TO BE UNDERSTOOD

Monday, 14 January, 2.15pm

Abstract

The first workshop focuses on the climate as a complex system. We will use John Sterman's (MIT) interactive C-ROADS computer model, which is based on the latest climate science available, to rapidly analyse the impact of a variety of factors. In groups we will discuss and reflect on why we have not succeeded yet to address climate change in a satisfactory way. The workshop is expected to provide a clearer understanding of the potential impact on climate of the different factors, prepare the participants for Workshop 2, and serve as a foundation for specifying goals for the IDC's imitative on design for climate change.

Workshop 2

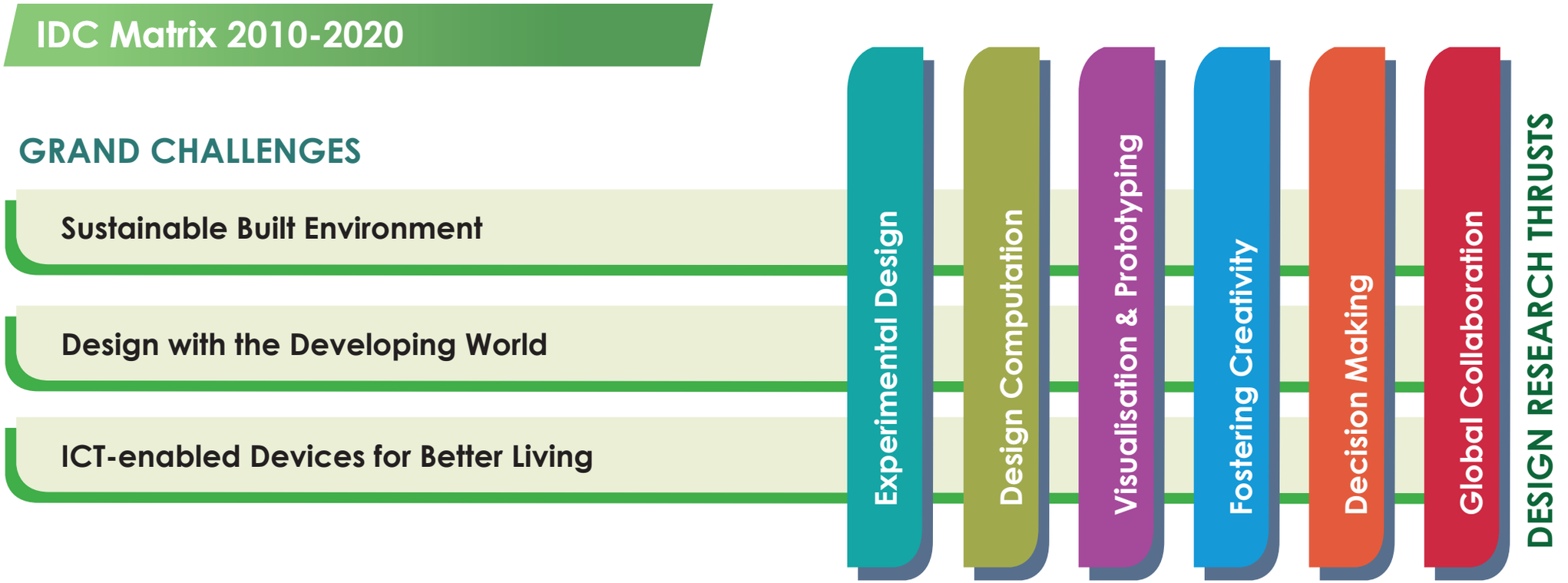
CLIMATE CHANGE:
A RADICAL SOCIO-TECHNICAL DESIGN REQUIRED

Tuesday, 15 January 15, 1.30pm

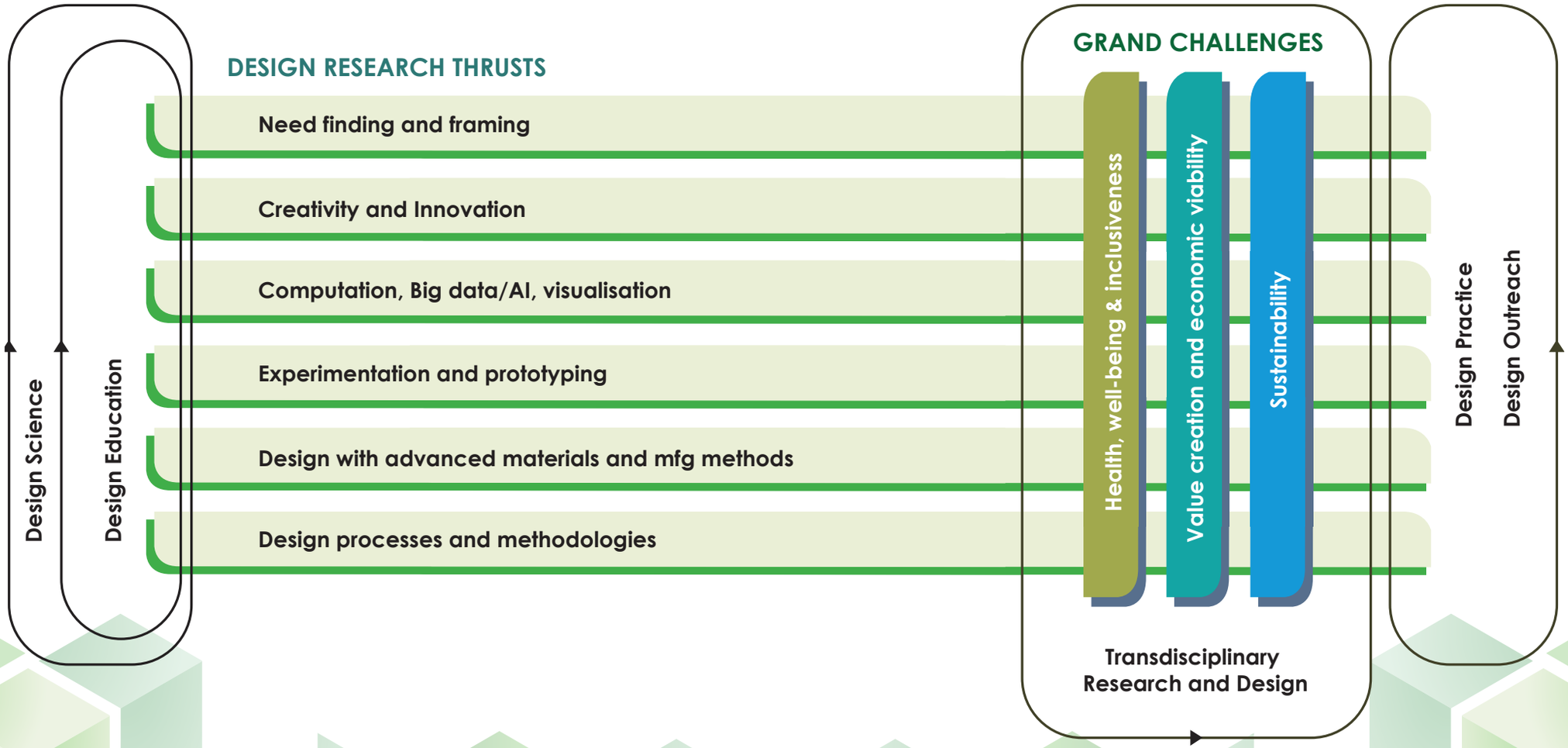
Abstract

The second workshop focuses on a subset of climate change challenges. Participants will work in groups on a particular challenge starting with a brainstorm session to identify the many different issues and factors involved in the challenge, and the expertise required to address these. This is followed by a discussion and reflection on the main question of Workshop 2: "How can each of us leverage their particular area of expertise to address the challenge, and how can we bring this together into an approach that promises to make a difference to climate change?". Our objective is to produce the outlines of some ambitious project ideas that go beyond each individual area of research to tackle the climate as a complex system. These project outlines will be concretized in the weeks following the Summit.

IDC Matrix 2010-2020



IDC Matrix post-2020



IDC 2020 and beyond

Vision

The IDC is the world's premier scholarly hub for technologically intensive, transdisciplinary design research, practice and education, aimed at creating a better world.

Goals

Design research, education and practice

- To advance and transform Design Science
  → body of knowledge, paradigms, core topics
- To advance Design Science and Innovation in and with the disciplines
  →transdisciplinarity
- To advance and transform Design Education
  → effective, efficient, innovative pedagogy
- To advance and transform organizations and society through Design Innovation
  → training, guidance, evidence-based methods and tools

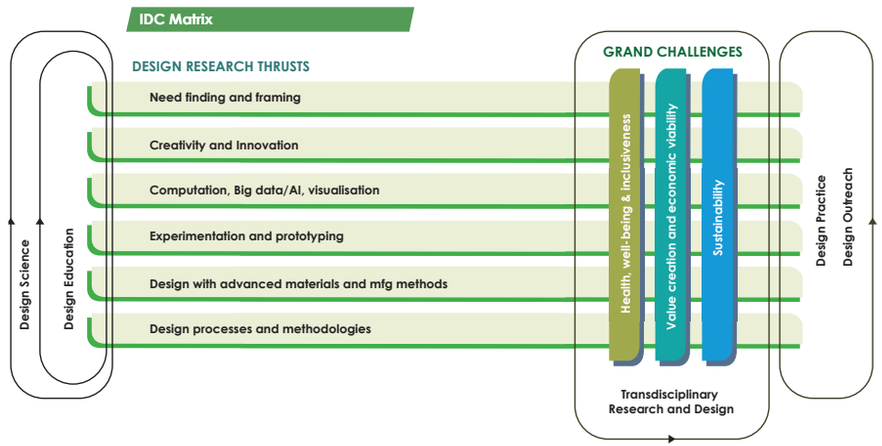
Organisation

- To create a sustainable unit within SUTD to secure the D in SUTD in education and research
- To create a sustainable platform to support and deepen the SUTD/MIT collaborations.
- To use the IDC platform to create a global network to "better the world by design"
- To develop and promote the SUTD Design Brand

Focus Areas

As in Phase 1, the IDC intends to pursue six areas of design research that are critically important to advance Design Science and ultimately affect design education and practice – the Design Research Thrusts. To ground the research, three critical societal needs – the Grand Challenges – were chosen. Research projects will address one or more Design Research Thrusts and one or more Grand Challenges, and are aimed at advancement of Design Science, education and practice.

Both the Design Research Thrusts and the Grand Challenges have been adapted to the advancements made thus far and new emerging and promising areas of research. In addition, three integrative areas were identified: Design Science, Design Education, and Transdisciplinary research and design.



Grand Challenges

The Grand Challenges represent critical societal needs where there exist larger-than-life barriers (and opportunities) without foreseeable solutions in the near future. It is important to undertake grand challenges as part of a forward-looking and innovative Centre in technologically-intensive design. By defining Grand Challenges, the work of the Centre is placed at the forefront of technology, engaged in problems and projects that are important to society, to the country, and to the Centre personnel, and developing results that have the potential for radical innovation and meaning. The Grand challenges are chosen to provide an opportunity for leadership and build on IDC's capabilities (and that of its parent institutions.

The new Grand Challenges focus on the contribution of Design Innovation and Design Science at three levels:

- Individual and community level (Health, well-being and inclusiveness);
- Business and economy level (Value creation and economic viability);
- Society and planet level (Sustainability).

Design Research Thrusts

Design Research Thrusts define the areas of design research that are critically important to advance design science, and ultimately affect design education and practice. The full-value chain of design, from identification of an opportunity through implementation and sustainable operation, define innumerable possibilities and thrusts that could be pursued. The focus will be on:

- Need finding and framing - Understanding and advancing the ability to identify needs, challenges and opportunities through a systems approach focused on stakeholder experiences
- Creativity and Innovation - Understanding and advancing the ability to create and innovate
- Design computation, AI, visualization - Understanding and advancing complex system analysis, evaluation and decision making using computation
- Design experimentation and prototyping - Understanding and advancing complex system analysis, evaluation and decision making using experimentation and prototyping
- Design with advanced materials and manufacturing methods - Understanding and advancing embodiment design and the creation of novel solutions through exploitation of opportunities of advanced materials and additive manufacturing
- Design methodologies and processes - Understanding and advancing the process of innovating systems, products and services.

Integrative Areas

New in the matrix and unique are the three integrative areas of research aimed at integration of research results to enable the IDC to truly transform Design Science as a discipline, Design Education, and Design Research and Design Innovation in and with the disciplines. This transformation will lead to an increased impact. These are:

Design Science

- Advance design science: the rigorous and actionable study of design with emphasis on the Design Research Thrusts (DRTs); the integration of DRT output into a coherent and structured body of knowledge, theories, models, taxonomies, etc.

- Transformation of the discipline: Alternative theoretical paradigms and methodological tools, cultures and historical legacies. Transdisciplinary research. Integration of social sciences to provoke and encourage critical self-reflection on technically intensive design situations represented by the DRT.

Design Education

- Design education and pedagogy: Development of a national level Design Innovation education and pedagogy, and of professional development of innovation capabilities.

- Design education research: Evaluation, improvement and renewal of design education; Translation and implementation of the body of knowledge from the Design Research Thrusts into evidence-based educational material.

Transdisciplinary Research and Design

- Design in the disciplines: the use of design approaches for the development of e.g. instrumentation, and for harnessing the potential of science into value through design

- Design research with the disciplines: Reliable translation of scientific results into design knowledge, guidelines, methods and tools for education and practice.

- Transdisciplinary knowledge creation: Processes for co-creation and co-research

Design Practice and Outreach

Design practice and outreach to society is realized through the DI@SG programme involving Design Education, Design Guidance and Design Incubation.

Design Innovation (DI) @SG

Providing world class professional Design Education, Guidance & Incubation support, across the entire design and innovation value chain, to a wide spectrum of local enterprises, government, and social stakeholders in Singapore

Design Education — Design Training & Professional Development program for private & public sector professionals and students, focusing on core design & innovation thinking abilities & skillsets.

Design Guidance — Targeted design consultations providing design & innovation support to enterprises participating in the DI@SG platform

Design Incubation — Enterprise Incubation and acceleration program for Singapore-based technology startups, leveraging the resources and innovation expertise of SUTD

Intergovernmental Panel on Climate Change (IPCC)

Breakdown of contributions to global net CO2 emissions in four illustrative emission pathways

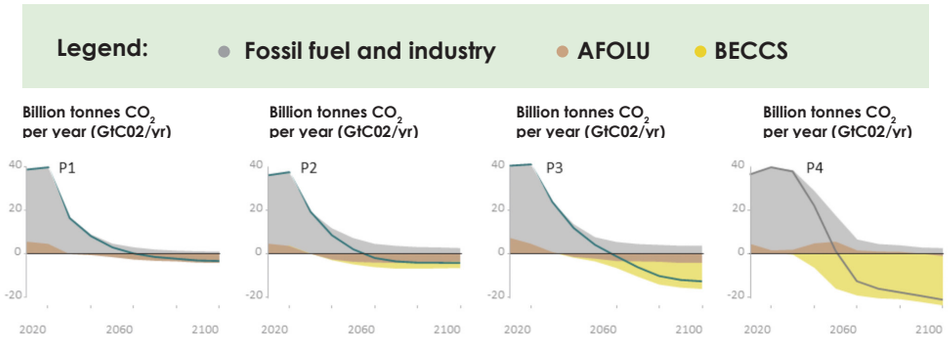
From the Special Report SR15 on Global Warming 8 October 2018

Human activities are estimated to have caused approximately 1.0°C of global warming above pre-industrial levels, with a likely range of 0.8°C to 1.2°C. Global warming is likely to reach 1.5°C between 2030 and 2052 if it continues to increase at the current rate.

The recently published IPCC SR 15 Special Report is focused on the impacts of global warming of 1.5°C above pre-industrial levels and the related global greenhouse gas emission pathways; its objective is to strengthen the global response to the threat of climate change.

Four emission pathways and system transitions consistent with 1.5°C Global Warming have been created (see Figure): they involve different portfolios of mitigation measures, striking different balances between lowering energy and resource intensity, rate of decarbonization, and the reliance on carbon dioxide removal. All pathways use Carbon Dioxide Removal (CDR), but the amount varies across pathways, as do the relative contributions of Bioenergy with Carbon Capture and Storage (BECCS) and removals in the Agriculture, Forestry and Other Land Use (AFOLU) sector.

Different portfolios face different implementation challenges and potential synergies and trade-offs with sustainable development.



P1: A scenario in which social, business and technological innovations result in lower energy demand up to 2050 while living standards rise, especially in the global South. A downsized energy system enables rapid decarbonization of energy supply. Afforestation is the only CDR option considered; neither fossil fuels with CCS nor BECCS are used.

P2: A scenario with a broad focus on sustainability including energy intensity, human development, economic convergence and international cooperation, as well as shifts towards sustainable and healthy consumption patterns, low-carbon technology innovation, and well-managed land systems with limited societal acceptability for BECCS.

P3: A middle-of-the-road scenario in which societal as well as technological development follows historical patterns. Emissions reductions are mainly achieved by changing the way in which energy and products are produced, and to a lesser degree by reductions in demand.

P4: A resource-and-energy-intensive scenario in which economic growth and globalization lead to widespread adoption of greenhouse-gas-intensive lifestyles, including high demand for transportation fuels and livestock products. Emissions reductions are mainly achieved through technological mean, making strong use of CDR through the deployment of BECCS.

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Contact Us

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