Beyond Intelligence

Massachusetts Institute of Technology
October 9-11, 2019

DESFORM 2019
CONFERENCE PROGRAM

DAY 1
WEDNESDAY, OCTOBER 9TH, 2019

Samberg Center, 6th Floor
Building E52, MIT Campus
50 Memorial Drive,
Cambridge, MA 02139

15.00	Conference Registration
15.30	**Welcome & Introduction** ▪ Yihyun Lim, Sara Colombo - *Conference Chairs, MIT Design Lab*
15.45	**Panel Presentations** **"Beyond Digital: Designing with Living Things"** ▪ Orkan Telhan, *Cofounder, Chief Design & Technology Officer, Biorealize Inc.* ▪ Jiwon Woo, *Biodesigner, Hypha Design* ▪ Laia Mogas Soldevila, *Co-Director, DumoLab*
16.30	Break
16.45	**Panel Discussion / Q&A** ▪ Moderated by Scott Penman, *MIT Design Lab*
18.00	**Conference Reception** ▪ DJ Performance by Philip Tan, *MIT Game Lab*

DESFORM2019
CONFERENCE PROGRAM

DAY 2
THURSDAY, OCTOBER 10TH, 2019

Samberg Center, 6th Floor
Building E52, MIT Campus
50 Memorial Drive
Cambridge, MA 02139

8.15 Conference Registration & Breakfast

9.00 **Welcome**
▪ Federico Casalegno, *MIT Design Lab*

9.15 **Conference Opening Words**
▪ Sara Colombo, Yihyun Lim - *Conference Chairs, MIT Design Lab*

9.30 **Keynote Presentation**
"AI as Tool, Partner, and Inspiration"
▪ Martin Wattenberg, *Google PAIR*

10.30 Coffee Break

10.45 **Paper Session 1 - Design Manifestos: What's Next**
Chairs: Sara Colombo and Yihyun Lim

▪ Future Forecasting Wicked Problems: A New Framework for Design
Fillippo Sanzeni, Ashley Hall, Paul Anderson *(Royal College of Art, London)*

▪ Eventual Design for an Emergent World
Nathan Felde *(Northeastern University, Boston)*

▪ The Decentralization Turns in Design: An Exploration Through the Maker Movement
Massimo Menichinelli *(RMIT University, Barcelona; Aalto University, Helsinki)*,
Priscilla Ferronato *(University of Illinois, Urbana-Champaign)*

11.45 Coffee break

12.00 ==**Paper Session 2 - Interacting with Domestic Intelligences**==
Chair: Edgar Rodriguez Ramirez

▪ **The Domestic Shape of AI: A Reflection on Virtual Assistants**
Davide Spallazzo, Martina Scianname, Mauro Ceconello *(Politecnico di Milano)*

▪ **Conversational Smart Products: a Research Opportunity, First Investigation and Definition**
Ilaria Vitali, Venanzio Arquilla *(Politecnico di Milano)*

12.40 Lunch +
==**Short Paper / Demo Session**==

▪ **Prosumeristic Publications: alt+yd**
Harshali Paralikar, Ajitesh Lokhande *(National Institute of Design, Paldi, Ahmedabad, Gujarat, India)*

▪ **Swimming Coach: An Immersive Swimming Learning System**
Shuo Li, Cheng Yao, Mingxuan He, Qingcong Wang, Ying Wang, Yuyu Lin, Juanli Liu *(Zhejiang University, Hangzhou),* Fan Xia *(Mercyhurst Preparatory School, Erie)*, Leijing Zhou *(Zhejiang University, Hangzhou)*

▪ **Designing Transparent Collaborations - Weave**
  Gissoo Doroudian *(College for Creative Studies, Detroit)*

▪ **Huxley: Intelligent Book as Essentialist Artefact**
David Ramsay, Joe Paradiso *(Massachusetts Institute of Technology, Cambridge)*

▪ **OlfacEnhancer: A Vision-Based Scented Necklace for Cross-Modal Perception and Olfaction Augmentation**
Yuyu Lin, Kai Zheng, Lijuan Liu, Yang Chen, Jiahao Guo, Shuo Li, Cheng Yao *(Zhejiang University, Hangzhou),* Fangtian Ying *(Hubei University of Technology, Wuhan)*

▪ **APOSEMA: Exploring Communication in an Apathetic Future**
Adi Meyer, Sirou Peng, Silvia Rueda *(University College London)*

▪ **HuValue: A Toolkit to Facilitate Considering Various Human Values in a Design Process**
Shadi Kheirandish, Mathias Funk, Stephan Wensveen *(Eindhoven University of Technology),*
Maarten Verkerk *(Maastricht University),* Matthias Rauterberg
(Eindhoven University of Technology)

- Playing with Systems: Tactile Games as System Prototypes
Tom Maiorana *(University of California, Davis)*
- Attributes of Aliveness: A Case Study of Two Interactive Public Art Installations
Humbi Song, Oliver Luo, Allen Sayegh *(Harvard University, Cambridge)*

- Understanding User Customization Needs: Requirements for an Augmented Reality Lamp Customization Tool
Ana Carina Palumbo, Hella Kriening, Barbara Wajda *(Eindhoven University of Technology)*,
Monica Perusquía-Hernández *(Eindhoven University of Technology; NTT Communication Science Laboratories)*

- Speculating on the Future of Graphic Design in the Age of Intelligent Machines
Sekyeong Kwon, Robyn Cook *(Falmouth University)*

- AI-Stylist: An AI-based Framework for Clothing Aesthetic Understanding
Xingxing Zou, Waikeung Wong *(The Hong Kong Polytechnic University)*

14.30   Introduction of AIM Institute Research Initiatives: Artificial Intelligence in Value Creation
Margherita Pagani, *Research Center on Artificial intelligence in Value Creation - AIM Institute Emlyon Business School*

14.40   **Paper Session 3A - Interacting with Urban Intelligences (I)**
Chairs: Yihyun Lim and Sara Colombo

- AI-to-Microbe Architecture: Simulation, Intelligence, Consciousness
Dennis Dollens *(Universitat Internacional de Catalunya, Barcelona)*

- Envisioning and Questioning Near Future Urban Robotics
Maria Luce Lupetti *(Delft University of Technology)*,
Nazli Cila *(Amsterdam University of Applied Sciences)*

- Robot Citizenship: a Design Perspective
Maria Luce Lupetti, Roy Bendor *(Delft University of Technology)*,
Elisa Giaccardi *(Umea Institute of Design)*

15.30   Coffee break

15.45 **Paper Session 3B - Interacting with Urban Intelligences (II)**
Chair: Scott Penman

▪ **Towards Transparency Between the Autonomous Vehicle and the Pedestrian**
Selin Zileli, Stephen Boyd Davis, Jiayu Wu
(Royal College of Art; Intelligent Mobility Design Centre, London)

▪ **The Coerced User and the Era of the Smart City Dissonance**
Guy Cherni, Roee Bigger *(Bezalel Academy of Arts and Design, Jerusalem)*

16.30 **Keynote Presentation**
"How to Design for the Unconscious"
▪ Matthias Rauterberg
Full professor for "Interactive Systems Design", Department of Industrial Design Eindhoven University of Technology

18.00 **Conference Dinner**
Charles River Sunset Cruise Dinner
We will depart from MIT Sailing Pavilion (location shown on campus map, p.13)

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CONFERENCE PROGRAM

DAY 3
FRIDAY, OCTOBER 11TH, 2019

Bartos Theater, Lower Level
Building E15, MIT Campus
20 Ames Street
Cambridge, MA 02139

8.15   Conference Registration & Breakfast

9.00   **Keynote Presentation**
"Adaptive Dynamics: Creating Intelligent Sportswear Experiences"
▪ Charles Johnson, *Global Director of Innovation, PUMA*

10.00   **Paper Session 4 - New Interfaces for Complex Ecosystems**
Chair: Davide Spallazzo

▪ Drawing Interfaces: When Interaction Becomes Situated and Variable
Ilaria Mariani *(Politecnico di Milano)*, Tommaso Livio *(Thingk)*,
Umberto Tolino *(Politecnico di Milano, Thingk)*

▪ Individual Mid-Air Gesture Informed by Conceptual Metaphors: A Case Study on
How Users Generate Mid-Air Gesture Sets to Control Video Streaming
Gulben Sanli Eren *(Istanbul Technical University)*

▪ A Pedagogy for Noticing – Soma Literacy and the Designer
Stephen Neely *(Carnegie Mellon University, Pittsburgh)*

11.00   Coffee break

11:20   **Introduction of Northeastern University Center for Design**
Paolo Ciuccarelli, *College of Art, Media and Design, Northeastern University*

11.30   **Paper Session 5 - Smart and Multi-Sensory Systems for Behavior Change**
Chair: Lucia Rampino

▪ Designing Phygital Activities in a Smart Multisensorial Room: A Collaborative Cognitive Environment for Children with and without Disabilities
Micol Spitale, Agnese Piselli, Franca Garzotto, Barbara Del Curto *(Politecnico di Milano)*

▪ Recommendations when Designing to Address Procrastination:
A Psychological Perspective
Helen Andreae *(Northumbria University, Newcastle upon Tyne; Victoria University of Wellington),* Abigail Durrant, Steven Kyffin *(Northumbria University, Newcastle upon Tyne)*

▪ R2S: Designing a Public Augmented Printed Media System to Promote Care Home Residents' Social Interaction
Kai Kang, Jun Hu, Bart Hengeveld, Caroline Hummels *(Eindhoven University of Technology)*

12.30   Lunch

13.15   **Participatory Workshop: "The Soma Literacy of AI"**
▪ Stephen Neely *(Carnegie Mellon University, Pittsburgh)*

14.15   **Paper Session 6 - Design and Semantics for Health and Inclusion**
Chair: Sotirios Kotsopoulos

▪ Nova Creatio: A Clinical Perspective on Rehabilitative Everyday Objects
for People with Chronic Stroke
Mailin Lemke, Edgar Rodríguez Ramírez, Brian Robinson *(Victoria University of Wellington)*

▪ The Semantics of Conspicuity: Design Strategies to Address Conspicuity in
Type 1 Diabetes Medical Devices for Adolescents
Madeleine J. Hazelton, Gillian M. McCarthy, Edgar R. Rodríguez Ramírez
(Victoria University of Wellington)

▪ Sitting Still: Seat Design for a New Head-Only MRI Scanner
Christy Wells, Edgar Rodríguez Ramírez, Mailin Lemke, Benjamin Parkinson
(Victoria University of Wellington)

 • Designing Research Prototype for the Elderly: A Case Study
Cun Li, Jun Hu, Bart Hengeveld, Caroline Hummels *(Eindhoven University of Technology)*

15.35   Coffee break

15.50   ==**Paper Session 7 - Designing with Humans, Machine Intelligence, and Data**==
Chair: Scott Penman

 • Plug-ins Jungle: Algorithmic Design as Inbuilt Dynamism
Between Human and Artificial Creativity
Giuseppe Bono *(University College London)*, Pilar Maria Guerrieri *(Politecnico di Milano)*
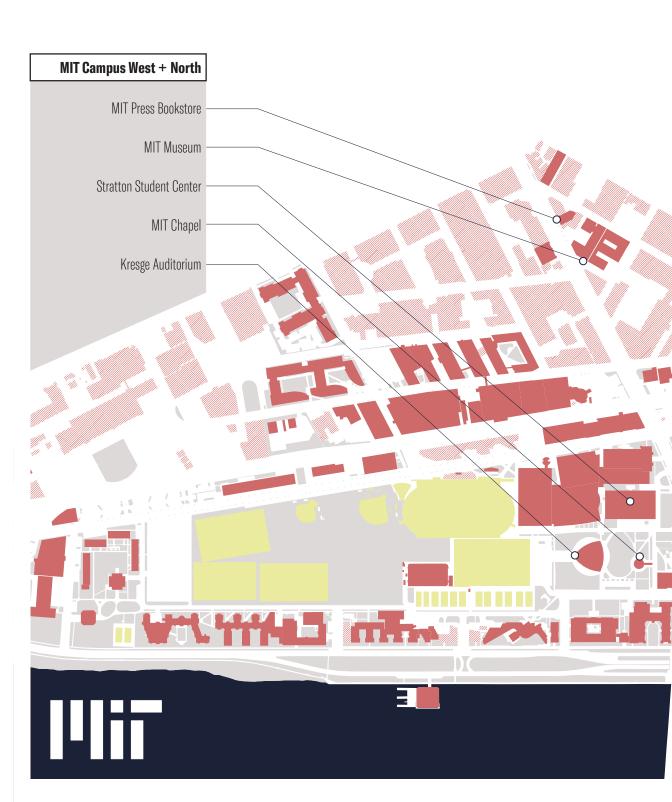
 • Defining a Data Impact Tool for Design Courses
Laura Varisco, Margherita Pillan *(Politecnico di Milano)*,
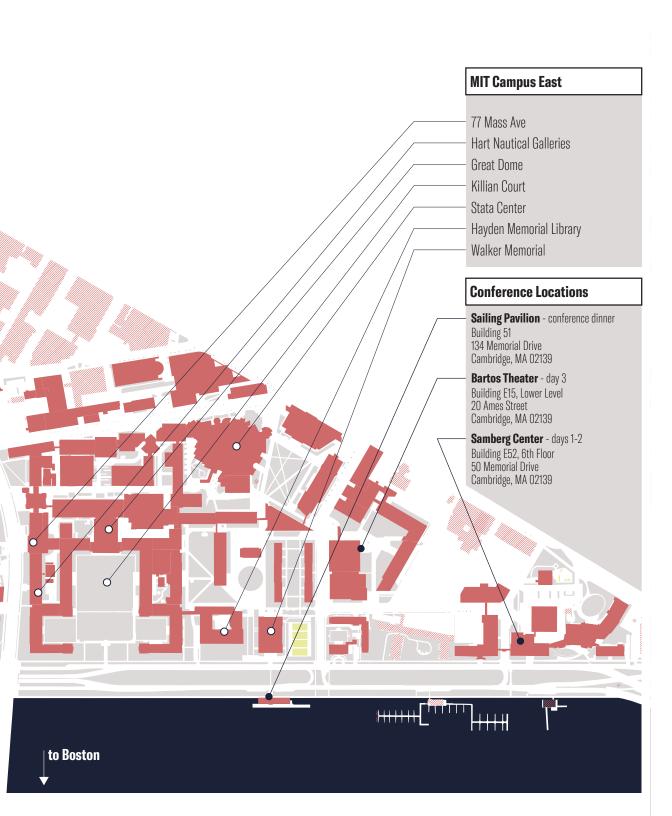Patrizia Marti *(Università' degli Studi di Siena)*

16.50   **Conference Closing Ceremony**

DAY 4
SATURDAY, OCTOBER 12, 2019

11.00   **Social Activity: Boston Brewing and Beyond**

We will meet at MIT Kendall T Station, in front of the Marriott Hotel.
Please bring your passport / ID to gain entry to the beer gardens.
If you'd like to explore on your own, please refer to the map at the end
of this booklet)

MIT Press Bookstore

MIT Museum

Stratton Student Center

MIT Chapel

Kresge Auditorium

MIT Campus East

77 Mass Ave

Hart Nautical Galleries

Great Dome

Killian Court

Stata Center

Hayden Memorial Library

Walker Memorial

Conference Locations

Sailing Pavilion - conference dinner
Building 51
134 Memorial Drive
Cambridge, MA 02139

Bartos Theater - day 3
Building E15, Lower Level
20 Ames Street
Cambridge, MA 02139

Samberg Center - days 1-2
Building E52, 6th Floor
50 Memorial Drive
Cambridge, MA 02139

to Boston

YIHYUN LIM   **SARA COLOMBO**

DESFORM19 CONFERENCE CHAIRS

DESIGN LAB, MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Beyond Intelligence
Re-focusing on Human Experience in Complex Artificial Ecosystems

Designing Ecosystemic User Experiences

In recent decades, design has faced profound challenges and transformations. The traditional approach to crafting and shaping the tangible world has been challenged by the world's infusion with digital technologies, which have made it smarter, more interactive, and more connected. DeSForM, the conference on the Design and Semantics of Form and Movement, was undertaken in 2005 as an attempt to foster discussion in the design community around how to design the meaning, aesthetics, and experience of responsive and dynamic artifacts. DeSForM's intent was to "present current research into the nature, character and behaviour of emerging new typologies of co-designed, content rich, connected and intelligent objects within adaptive systems."

Those 'emerging new typologies' of 'intelligent objects' have developed and spread over the following years, bringing the rise and formalization of new areas of design research, such as interaction design, user experience, and the aesthetics of interaction. These domains have been widely investigated in the works presented and debated in the past editions of DeSForM.

However, recent technological developments are causing even more rapid and extreme changes than the ones witnessed at the beginning of this century. The emergence of artificial intelligence and machine learning, flexible electronics, virtual and augmented reality, miniaturized and implantable sensors, and hybrid synthetic-biological materials have not only provided designers with new design ingredients, but also generated new cultural and social landscapes in which they must operate.

In this context, designers are called to design not intelligent products within adaptive systems, but rather those adaptive systems as a whole. Objects can no longer be interpreted and designed as independent elements, detached from the other components of the complex digital-physical ecosystems they belong to. In such hybrid ecosystems, new distributed intelligences, advanced materials and interfaces, sensing technologies, data, and humans are deeply interconnected and mutually shaped. Their understanding, design, and evaluation demand approaches and tools able to tackle this complexity. Despite this, as these systems become increasingly intelligent, their meanings, aesthetics, and ethics still seem to be overlooked.

Designing beyond intelligence means that the design of such complex and smart ecosystems should consider issues beyond mere algorithmic thinking and functionality. Scholars and practitioners in the design field are encouraged to reflect on the connections and mutual relations between the performance of these intelligent ecosystems and their physical appearances, meanings, personalities, and interaction modalities. In doing so, they will be able to address the design of ecosystemic user experiences.

Going 'Beyond Intelligence'. New Challenges for Design

In the XI edition of DeSForM, hosted by the Massachusetts Institute of Technology, we explore the implications of recent and emerging technological transformations in the practice of design, with a particular focus on the human experience of these complex systems. We invited designers, artists, researchers, and industry practitioners to address the need to design for distributed, hyperconnected, and learning intelligent ecosystems, and to investigate how their meanings, experience, and ethics can be approached. In doing so, we identified a number of possible challenges that we believe are worth exploring in the upcoming years. They refer to i) the growing complexity of the concept of user experience; ii) emerging forms of interaction with human-like intelligences; iii) the ethical implications of digital-physical systems; and iv) the new roles designers should assume in this context.

Challenge 1. Experiencing Complexity

As ecosystems of digital-physical solutions become more layered, distributed, and connected, the user experience also grows in complexity. New elements need to be considered, including the meanings of these systems, the multisensory and multimodal interactions they necessitate, and the emotions that such interactions generate.

The tangible manifestations of the systems users interact with are just a tiny part of a huge underlying infrastructure of data, algorithms, platforms, and digital contents. As functions overlap in the same product and digital contents constantly change, physical objects become just the medium for a plethora of meanings derived from multiple connected platforms. What is the role of aesthetics in such dynamic, digital-physical ecosystems? What meanings can tangible forms convey? What new tools and frameworks are needed to design and evaluate the growing complexity of user experience?

Challenge 2. Interacting with New Intelligences

Artificial intelligence opens up new frontiers for design, where emerging forms of distributed intelligence become design material. Technological advancements in this field now provide the user with the possibility to have increasingly human interactions with non-human artifacts. Users' interactions with specialized intelligences have progressively taken on the appearance of companionship and assistantship, as seen in the rise of chatbots and social robots. How does artificial intelligence transform artifacts (objects, spaces) and their interaction modalities? How can design give meaning and form to artificial intelligence, when embedded into products? How do artifacts' aesthetics and experience change through AI at home, at work, or in public spaces? This material should be fully investigated in terms of tangible manifestations, social implications, and impact on the design process and the user experience.

Challenge 3. Societal Impacts

The above-mentioned transformations surely pose new challenges to design, not only in shaping the tangible forms of these systems, their meanings, and aesthetics, but also in anticipating the consequences they might have on humans at the individual and societal levels. The emergence of AI, robotic solutions, and big data connected with the spaces, objects, and people we interact with everyday will create new landscapes for future generations of designers. This will require designers to adopt new lenses in the design and evaluation of emerging technology, and it will necessitate that designers equip themselves with new ethical paradigms.

How will algorithmic decision making and autonomous systems impact user experience and behavior? How can we design for transparency and reliability? What are the long-term effects of new digital technologies on society?

As systems become smarter, more self-governed, and increasingly embedded into our reality, designers should develop new approaches and methods to consider ethical issues in their practice.

Challenge 4. Future Roles of Design

This evolving context calls for new design skills and ways of thinking that go beyond the traditional field of design. How will this domain change, in order to interface with new fields of knowledge such as biotechnology, computer science, AI, and ethics? What are the future roles of design in shaping the growing complexity of the artificial world, where the boundaries between artificial, human, and natural fade? What role can designers play in the multi-disciplinary teams that will envision future systems which are more and more interactive, interconnected, and even unpredictable?

While some of these challenges are just emerging, other issues seem to be already compelling, or will likely be in a short time. This conference invites the design community to reflect deeply on the current and future transformations enabled by technology, as well as their effects on design itself, and on society as a whole. It will take time to fully understand this new landscape and its effects on humans, and to approach it with a critical eye. As some of the works included in these proceedings point out, design is just now starting to react to this transitional moment and to equip itself with new sets of concepts, approaches, and methods to face this changing reality.

Future Perspectives

This edition of DeSForM covers a wide range of topics related to designing with new forms of intelligence in complex human-artificial and digital-physical ecosystems. If the trends we are debating at this venue continue to develop, distributed intelligences could potentially affect any designed reality, as well as the experience that results from users' interactions with those intelligences.

While design as a discipline is required to develop specific frameworks and tools to tackle the growing complexity of our world, such a diversity of application fields also calls for a collaborative approach with other areas of knowledge. Designers will need to operate more and more in concert with technologists, computer scientists, architects, social scientists, psychologists, and ethicists, as well as policy makers and industry players, in a joint effort to reduce the risks and amplify the positive potential of these transformations. This will ultimately, support the type of technological development that is truly centered on and beneficial to humans, both at the individual and societal levels.

We hope you enjoy the discussion and dissemination of discourse within these areas at the DeSForM19 Beyond Intelligence Conference.

October 2019
Cambridge, MA

DESFORM2019
PAPER SESSIONS

DeSFoRM | Beyond Intelligence conference paper sessions are structured to address some of the emerging questions raised above.

Session 1. Design Manifestos

The first session is dedicated to sharing thoughts on the roles of designers and the meanings of design practice through a series of design manifestos. What are new tools, methods, and frameworks that allow designers to forecast and solve the wicked problems of the future? Observing the current landscape of complex systems and varied forms of intelligences - from artificial machines to synthetic biology - some 'turns' in design practice are identified, which led us to the current state. These manifestos question the role of the designer and the meaning of agency as design practice becomes collaborative at all stages, especially through the use of algorithmically enhanced design tools and artificial intelligence. These questions are expected to repeatedly rise to the forefront throughout the conference.

Session 2. Interacting with Domestic Intelligences

Perhaps we are more accustomed to interacting with artificial intelligence than we think. Virtual assistants and conversational agents are slowly becoming the norm in domestic settings through the use of smart connected products and social robots. The works presented in this section analyze the current product landscape of domestic intelligences and provide an initial understanding of relationships between form, function, and meaning. As we move into the future of embedded intelligences in our everyday environments, how should we design the shape and interaction modalities of artificial intelligence to effectively translate its function and meaning in an intuitive way?

Session 3. Interacting with Urban Intelligences

From autonomous vehicles to delivery robots, we will soon, if we are not already, be sharing our urban environment with other intelligent entities. We can no longer opt out from this smart environment experience, and we have no other option but to interact with such systems and provide resources (data) back into their digital networks. Papers in this session explore the opportunities and affordances that become available in the design of such environments, as we learn to coexist with various forms of artificial intelligence. From the concept of

'robot citizenship' to that of 'coerced' users, authors suggest new approaches to bring the perspective of urban robots, citizens, and other autonomous systems into the design process.

Shifting our view to the building scale, various forms of intelligence will also become embedded in our architecture. The rise of synthetic biology and the use of engineered microbes as building blocks in urban architecture is opening up an era of hybrid buildings, which function as metabolic systems. Can we simulate nature and create environmentally performative, intelligent, and living buildings?

Session 4. New Interfaces for Complex Ecosystems

In this plethora of complex ecosystemic experiences, what are the new interfaces for control and interaction? Expanding from voice, text, and gesture-based modalities, what novel interactions can we design for? As we start to build a dictionary of universal interactions with smart products, how shall we explore the semantics of interaction language? Here we explore research in the design of interaction metaphors to represent conceptual understanding of situations (and translation of our language) to communicate intuitively with smart devices. But perhaps before we attempt to design new languages, we should think about methods to reveal and recognize the affordances of technologies in relation to our body, and the aesthetics of interactions it brings.

Session 5. Smart and Multi-Sensory Systems for Behavioral Change

Although the experiencing human body is the constant in this ever-changing environment of complex ecosystems of intelligences, the designed experience of these systems induces behavioral changes in its users. The papers in this session investigate the effects of the merger of digital experiences and physical environment on human behavior, from creating 'phygital' activities that affect the cognitive learning abilities of children, to mitigating procrastination through designed interventions in built environment and interactive artifacts. Moreover, attention is paid to the experience of caring in elderly living environments through the use of connected technologies. What experiences can we augment with technologies and what should remain as human-driven?

Session 6. Design and Semantics for Health and Inclusion

Focusing on the health industry, we look further into the semantics and aesthetics of interaction in medical and assistive devices. This topic explores semantic strategies and design criteria to overcome social stigmas in the use of assistive devices, and to improve rehabilitation processes as well as overall user experience.

Session 7. Designing with Humans, Machine Intelligence and Data

This final topic brings us back to the discussion on the role of design and the various societal issues designers should consider in their research and practice. What tools and methods can help us to navigate the complexity of data privacy issues in the co-design process? Moreover, as our design software tools become more intelligent and generative, should we rethink the notion of design agency, and invite our software tools to become our creative partners?

Interactive Demos

Short papers and their related interactive demos explore five thematic areas: designing immersive experiences, AI and human collaboration, AI curated experiences, sensory augmentation and communication, and processes and tools for design and awareness.

Immersive Experience

Virtual reality is often used in safety training for hazardous situations or difficult to access environments. What if mixed-reality experiences are used to learn swimming? Can simulated experiences help overcome the fear of water, and bring the experience of swimming to those with limited access to aquatic environments? Along the line of making experiences real, another project explores the 'aliveness' of public art installations, to bring continuous life through embedding real-time responsiveness and audience participation in art experience.

AI and Human Collaboration

Here we explore the design of transparent collaboration between humans and machine intelligences. From graphic design to web contents, and also digital publications, how do we define design agency when algorithms and machine intelligence become active creators of experiences?

AI Curated Experiences

From music to movie platforms, we are accustomed to algorithmically curated contents based on individual preferences. How about algorithmically-curated clothing suggestions? Can machine intelligence evaluate aesthetics, cultural nuances, individual preferences, and other design elements? Thinking further about human experiences, can AI understand and foresee users' desired engagement level, and curate a holistic reading experience by, for example, selecting appropriate content and creating an optimal ambient sensory environment?

Sensory Augmentation and Communication

Human experience is deeply affected by sensory experiences and social interactions. Can an augmented olfaction device strengthen the link between olfaction, vision, and memory? Or better yet, can we translate our emotions and visually communicate these through an interactive wearable device for the face? Can digital technology and algorithms enhance human communication and social interaction, or is this a false hope?

Process and Tools for Design and Awareness

We close the Interactive Demo session with new toolkits and processes for design and awareness. What are the ways to guide a value-driven design process and the creation of meaningful products? What methods can help unpack complex systemic challenges like climate change, to stimulate discussion and ideate potential interventions?

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MARTIN WATTENBERG

CO-LEAD, GOOGLE PAIR (PEOPLE + AI RESEARCH)

Martin Wattenberg co-leads Google's PAIR (People + AI Research) initiative and the Big Picture team. His work at Google, with long-time collaborator Fernanda Viégas, currently focuses on making AI technology broadly accessible and reflective of human values. He, his team, and Fernanda have also created end-user visualizations for products such as Search, YouTube, and Google Analytics.

Before joining Google, Fernanda and he founded Flowing Media, Inc., a visualization studio focused on media and consumer-oriented projects. Prior to Flowing Media, they led IBM's Visual Communication Lab, which created the ground-breaking public visualization platform Many Eyes. He came to IBM from Dow Jones, where he was the Director of Research and Development at SmartMoney.com. His work there included some of the earliest pieces of interactive journalism.

He is known for visualization-based artwork, which has been exhibited in venues such as the London Institute of Contemporary Arts, the Whitney Museum of American Art, and the New York Museum of Modern Art.

He has a Ph.D. in mathematics from U.C. Berkeley, focusing on dynamical systems.

AI AS TOOL, PARTNER, AND INSPIRATION

How should people relate to artificial intelligence technology? Is it a tool to be used, a partner to be consulted, or perhaps a source of inspiration and awe? As technology advances, choosing the right human / AI relationship will become an increasingly important question for designers. I will show a series of examples--ranging from data visualizations to tools for medical practitioners--that illustrate how AI can play each of these roles in turn. I will then discuss and analyze the considerations that determine which role may be right for which situation.

G. W. MATTHIAS RAUTERBERG

FULL PROFESSOR FOR "INTERACTIVE SYSTEMS DESIGN"
DEPARTMENT OF INDUSTRIAL DESIGN
EINDHOVEN UNIVERSITY OF TECHNOLOGY

Prof. Dr Matthias Rauterberg received a B.S. in Psychology (1978) at the University of Marburg (Germany), a B.A. in Philosophy (1981) and a B.S. in Computer Science (1983), a M.S. in Psychology (1981) and a M.S. in Computer Science (1986) at the University of Hamburg (Germany), and a Ph.D. in Computer Science/ Mathematics (1995) at the University of Zurich (Switzerland). From 2006 till 2015 he was the head of the Designed Intelligence research group, department of Industrial Design at the Eindhoven University of Technology (TU/e, The Netherlands). He has over 450 publications in international journals, conference proceedings, books, etc. His recent research is in the area of entertainment computing, cognitive systems, human-computer interaction, and design science.

HOW TO DESIGN FOR THE UNCONSCIOUS

We can distinguish human activities as intentional and unintentional, conscious and unconscious, and many more. Most of modern interaction design in the West relies on conscious decision making of the user. One challenge in the upcoming design of interactive products and systems is how to tap into the unconscious of human behavior. Such kinds of design have to rely on input signals beyond introspection based on human language. These new types of input are bio-signals, video monitoring, deep learning, etc. The presentation will address potential building blocks of the unconscious and related design challenges. I will show potential directions into the future.

CHARLES JOHNSON
GLOBAL DIRECTOR OF INNOVATION, PUMA

Charles Johnson has more than 30 years' experience in the sports industry specializing in product strategy and innovation. He has served global brands such as Adidas, Converse and Ralph Lauren both as an employee and formerly through Sports Creative Group, Inc., the New York-based consultancy he founded. He received his formal design training at Carnegie Mellon. In his current role as PUMA's Global Director of Innovation, Charles oversees a network of designers, engineers, material specialists, and scientists responsible for bringing life to innovative, performance enhancing products and systems for athletes.

ADAPTIVE DYNAMICS. CREATING INTELLIGENT SPORTSWEAR EXPERIENCES

Adaptive Dynamics: Creating Intelligent Sportswear Experiences will discuss PUMA's legacy in innovation for human performance. It will discuss PUMA's journey in integrating the experience of Adaptiveness with digital technology, ecosystem of connected user-experiences, and new forms of intelligences, such as living microorganisms. From track spikes to football kits to automated lace footwear and platforms for customized user experiences, this presentation will address innovation perspective from the industry side, and highlight how PUMA is defining the future vision for sportswear in the current landscape of technological developments.

BEYOND DIGITAL. DESIGNING WITH LIVING THINGS

ORKAN TELHAN

Orkan Telhan is an interdisciplinary designer whose investigations focus on the design of interrogative objects, interfaces, and media, engaging with critical issues in social, cultural, and environmental responsibility. Telhan is an Associate Professor of Fine Arts - Emerging Design Practices at University of Pennsylvania, Weitzman School of Design. He holds a PhD in Design and Computation from MIT's Department of Architecture. He was part of the Sociable Media Group at the MIT Media Lab and a researcher at the MIT Design Lab. Telhan's individual and collaborative work has been exhibited internationally in venues including the Istanbul Biennial (2013), Istanbul Design Biennial (2012, 2016), Milano Design Week, Vienna Design Week, the Armory Show 2015 Special Projects, Ars Electronica (2007, 2017), ISEA, LABoral, Archilab, Matadero Madrid, Architectural Association, the Architectural League of New York, MIT Museum, Museum of Contemporary Art Detroit, and the New Museum of Contemporary Art, New York.

JIWON WOO

Jiwon Woo is a multidisciplinary artist, designer, and researcher based in New York. She is a lecturer at the University of Pennsylvania and a founder of Hypha Design, based in Korea. Woo investigates the rapidly transforming role of art, design, life science, and technology across generations. She researches new biologically designed materials and fabrication methods derived from nature and the human body. Woo won an Honorary Mention at Ars Electronica Prix 2019 at the Artificial Intelligence & Life Art category, and she is also the final winner of Bio Arts and Design Award 2017. Woo's work has been exhibited on an international scale at the Victoria and Albert Museum in London, London Design Festival 2018, Milan Design Week 2018, Ars Electronica Festival 2018, and others. She received an MFA from the University of Pennsylvania, M.Political Science from Yonsei University, and BA from Wellesley College.
woojiwon.com

LAIA MOGAS SOLDEVILA

Laia Mogas is a licensed Architect and experienced Researcher interested in biological material practices in design. Her work at the Tufts Living Materials Silklab focuses on design and development of functional biomaterial products. She has worked at the MIT Media Lab Mediated Matter Group, MIT SUTD Robotics Lab, MIT Dept. of Material Science Ortiz Lab of Structural Materials, and at the UPC CODA Group. She has taught at the MIT Architecture Dept., MIT Media Lab, and at the M.S.AAD post-professional program at Cornell University in NYC.
Laia is trained in Design and Fine Arts in Europe, and in Digital Fabrication and Materials Science in the USA. She is now finishing her Interdisciplinary PhD at Tufts University's Biomedical Engineering Department. Laia's research contributions have been published in peer-reviewed scientific journals and shared in international conferences such as MRS, IASS, eCAADe, Biofabricate, and ACADIA. Her work has been exhibited at the Copper Hewitt Smithsonian, the Biotopia-Fest in Munich, the Barcelona DHUB, the MIT Museum,, the Lisbon Architecture Triennial, the Istanbul Design Biennial, and the Pompidou Center in Paris. Since 2008, she co-leads the DumoLab design studio with Jorge Duro-Royo at the intersection of architecture, material practices and advanced computation.

SOMA LITERACY OF AI

In this short session, Stephen Neely presents methods from theater/music performer training to challenge participants to question the ways technologies engage the actual human reality and notice the variables of experience we are all pre-reflectively attuned to.

STEPHEN NEELY

ASSISTANT PROFESSOR IN DALCROZE EURHYTHMICS, CARNEGIE MELLON UNIVERSITY

Stephen Neely, PhD, Carnegie Mellon Assistant Professor in Dalcroze Eurhythmics, is a teacher, conductor, theorist, musician, and clinician who teaches, lectures, and presents workshops in the fields of design, music, architecture, and pedagogy. He is a dynamic speaker who enjoys traveling to present hands-on workshops and clinics focusing on the overlaps between music, design, the body, esthetics, performance, and experience. He has entertained invitations to present his work in Mexico, Indonesia, China, England, Switzerland, and throughout the USA. An introduction to his research agenda can be found through his TEDx talk and a more thorough discussion in his dissertation Soma Literate Design–recentering the interstitial in experience.
"My research focuses on the physical nature of experience and the reflections of the artful gesture in everyday interactions—that is, the ways in which our feeling bodies are necessary components of musical participation and how that understanding presents artful potential in any experience."

DATA-DRIVEN INTERACTIVE ART INSTALLATION
THE EPOCHS

The Epochs is a data-driven interactive audiovisual art installation visualizing the different facets of two technological revolutions in human history: Internet and Social Media. Through open data, the work generates movement and clustering of visual content based on the growing number of digital citizens from the dawn of the Internet in 1990 until today. As it's easy to forget how a life without ubiquitous technologies was, the work inspires the audience to interact and look back into the digital epoch via the camera sensor. The Internet may have already changed the world, but no doubt big changes still lie ahead.

LOOK ALIVE STUDIO

LOOK ALIVE Studio is a collective of creative technologists from MIT. We help brands tell their stories through immersive and interactive experiences.
lookalivestudio.com

Kamin Phakdurong and Yangyang Yang
MIT Integrated Design and Management '16,
Co-founders of Look Alive Studio

BOSTON BREWING AND BEYOND
Craft Beer Brewery Tour of Boston

Boston Brewing and Beyond Tour	Other Points of Interest
Rose Kennedy Greenway Join us for a walk along Boston's Rose Kennedy Greenway, complete with art, interactive AR exhibits, and beer gardens! 21+, passport required.	to Bunker Hill Monument Museum of Science Charlestown Navy Yard North End Boston Public Market Boston City Hall Faneuil Hall
Freedom Trail Follow the brick path through downtown Boston to learn about its many historical sites. (self-guided tour)	
1 Wachusett Brewing Co. Boston Brew Yard	New England Aquarium Massachusetts State House Beacon Hill
2 Trillium Garden on the Greenway	start of Freedom Trail Downtown Crossing Boston Common and Public Garden
3 City Winery on the Greenway	South Station Seaport Chinatown

Further Afield	
for more of our local favorites, check out: **Lamplighter Brewing Company** **Sam Adams Boston Brewery** **Harpoon Brewery and Beer Hall**	Back Bay Copley Square Trinity Church Prudential Center Isabella Stewart Gardner Museum MFA

MIT Massachusetts Institute of Technology

MIT Design Lab

CMSW Comparative Media Studies | Writing

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