

PANEL #1

NexComm 2024 & DigitalWorld 2024

Theme: Human-Technology

Focus: Challenges on Technology Adoption and Adaptation to Humans-Machine Co-Existence



CONTRIBUTORS

Moderator

Prof. Dr. Lasse Berntzen, University of South-Eastern Norway, Norway

Panelists

- Prof. Dr. Qing Li, Towson University, USA
- Prof. Dr. Ray Jones, University of Plymouth, UK
- Assoc. Prof. Dr. Susanne Koch Stigberg, Østfold University College, Norway
- Prof. Dr. Michael Hsiao, Virginia Tech, USA



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- Citizen-centric technology
- Technology built around the citizen
- Understanding the citizens
- How to achieve adoption?
- Start with the problem, not with the technology
- Lean startup / minimum viable prototype (MVP)
- Learn from the citizens
- Co-creation



Lasse Berntzen, Professor, Information Systems, University of South-Eastern Norway

lasse.berntzen@usn.no

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- "Al invasion"
 - Al evolves fast, how can we cope?
 - AI & ethics: what is considered ethical? What are laws? Rules? Regulations?



Qing Li Towson University, USA



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Digital exclusion

- Risks: age, poverty, geography, some cognitive & physical conditions, lack of social support
- Addressed by: better design, politics, support organisations and structures
- One approach: intergenerational codesign should lead to better design for the digitally excluded and a better understanding and support from younger to older generation



Ray Jones PhD MBE
Professor Health
Informatics, Centre for
Health Technology,
University of Plymouth

ray.jones@plymouth.ac.uk

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Participatory Design (PD) meets AI

- Risks: Al systems are deployed rapidly across domains of considerable social significance—in healthcare, education, employment, criminal justice, and many others—without appropriate safeguards or accountability structures in place.
 (A. Berditchevskaia, "Participatory AI for humanitarian innovation")
- Needs: Participatory approaches for the design, development, and evaluation of AI systems across industries, academia and the public sector (T. Bratteteig and G. Verne, "Does AI make PD obsolete? exploring challenges from artificial intelligence to participatory design")
- PD approach: aimed at understanding the technology and its potential for changing workplaces and work practices, as well as to open up for people to have a say in choices concerning the technology during its design and use. (J. Greenbaum and F. Kensing, "Heritage: having a say")



Dr. Susanne Stigberg
Assoc. Professor
Department for Information
Technology and
Communication, Østfold
University College

susanne.k.stigberg@hiof.no

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Three different perspectives on AI and PD:

- Al tools: in PD for design inspiration or co-ideation (A. Cai et al., "DesignAID: Using Generative AI and Semantic Diversity for Design Inspiration"; L.-Y. Chiou, P.-K. Hung, R.-H. Liang, and C.-T. Wang, "Designing with AI: An Exploration of Co-Ideation with Image Generators")
- PD activities: to collaboratively envision digital futures with AI (V. Popova, "Cocreating Futures for Integrating Generative AI into the Designers' Workflow"; M. Muller and Q. V. Liao, "Exploring AI Ethics and Values through Participatory Design Fictions")
- Lacking: Mutual Learning to understand AI and its potential for changing our lives. "It may just be us who needed reminding of the centrality of mutual learning to Participatory Design, but it appears to be less explicitly discussed in PD papers these days" (Robertson, T., Leong, T. W., Durick, J. and Koreshoff, T., "Mutual learning as a resource for research design")



Dr. Susanne Stigberg
Assoc. Professor
Department for Information
Technology and
Communication, Østfold
University College

susanne.k.stigberg@hiof.no



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- T. Bratteteig and G. Verne, "Does AI make PD obsolete? exploring challenges from artificial intelligence to participatory design," in *Proceedings of the 15th Participatory Design Conference: Short Papers, Situated Actions, Workshops and Tutorial Volume 2*, in PDC '18. New York, NY, USA: Association for Computing Machinery, Aug. 2018, pp. 1–5. doi: 10.1145/3210604.3210646.
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- A. Cai *et al.*, "DesignAID: Using Generative AI and Semantic Diversity for Design Inspiration," in *Proceedings of The ACM Collective Intelligence Conference*, in CI '23. New York, NY, USA: Association for Computing Machinery, Nov. 2023, pp. 1–11. doi: 10.1145/3582269.3615596.
- L.-Y. Chiou, P.-K. Hung, R.-H. Liang, and C.-T. Wang, "Designing with AI: An Exploration of Co-Ideation with Image Generators," in *Proceedings of the 2023 ACM Designing Interactive Systems Conference*, in DIS '23. New York, NY, USA: Association for Computing Machinery, Jul. 2023, pp. 1941–1954. doi: 10.1145/3563657.3596001.
- M. Muller and Q. V. Liao, "Exploring AI Ethics and Values through Participatory Design Fictions," *Hum. Comput. Interact. Consort.*, 2017.
- Robertson, T., Leong, T. W., Durick, J. and Koreshoff, T. 2014. Mutual learning as a resource for research design. Proceedings of the 13th Participatory Design Conference: Short Papers, Industry Cases, Workshop Descriptions, Doctoral Consortium papers, and Keynote abstracts Volume 2. Windhoek, Namibia: Association for Computing Machinery.



Dr. Susanne Stigberg
Assoc. Professor
Department for Information
Technology and
Communication, Østfold
University College

susanne.k.stigberg@hiof.no



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Challenges in Human-Machine Interaction and Adaptation

- Natural Language is one of the most versatile mediums. But how do we bridge the huge gap between NL and Machine's Language?
- Challenge 1 NL Ambiguous / lacking detail or context
 - A NL sentence can have multiple interpretations
 - A NL sentence can mean something different under various contexts
 - A NL sentence can assume the machine knows common sense
- Challenge 2 Level of abstraction in NL can be too low / overly verbose
 - How to differentiate necessary vs. unnecessary details?
- Challenge 3 Break down to sequence of machine-executable actions
 - LLM can generate new tokens, but how to convert these tokens into proper sequence of actionable primitives?



Michael Hsiao Virginia Tech

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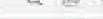
Challenges in Human-Machine Interaction and Adaptation

- Natural Language is one of the most versatile mediums. But how do we bridge the huge gap between NL and Machine's Language?
- Challenge 1 NL Ambiguous / lacking detail or context
 - Example: X protects Y from Z
 - How does X protect Y? Does it shoot at Z?
 - Machine needs to fill in missing details
- Challenge 2 Level of abstraction in NL can be too low / overly verbose
 - Example: The A under the gloomy sky slowly sneaks up on B behind the rocks.
 - How to interpret the gloomy sky, rocks, etc.
 - Machine needs to filter out unimportant/irrelevant details
- Challenge 3 Break down to sequence of machine-executable actions
 - Example: When A touches B before C, ...
 - How to sequence the order of predicates and put them in multiple steps?



Michael Hsiao Virginia Tech





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Instructions

Tutorials

The player controls the (sb);
 W User to the above recease.

Processing your actions...

- When the left arrow is present, the rabbit moves left, Understood with 99% pertainty.
- When the right arrow is pressed, the rebot moves right. Uniterstood with Mills pertainty.
- When the up arrow is pressed, the ratiost moves up.— Uprestand with Simp certainty.
- When the direct arrow is prospect, the rabbit moves skews,—Understood with 80% committe.
- When the rabbit touches a correct the carried disappears. Understood with 60% sentainty. note: the object in the consequent will die, disappear, or explode in the cycle/hame immediately after the antecedent event.
- When a fox sees the ratios if ofereign it Go Lines veges (1) and PROGRAMMATICALLY UNICLEAR; for the second pronoun it, it is interpreted as ratios. For sentences containing multiple objects, you should have only one pronoun to reduce ambiguity and enfunce clarity. Everytim When a fox sees the ratios. It chases the ratios.

All Lates to the above harmonic

.. Continues and Self-Continues - main the first process of in interpreted are tree

NOTE: No description about boodeni in your gerne. Examples:

- When (cts) touthes a border, a lunts around.
- When labitimether the top border, it man.
- . When joby touches the right border, it wraps around

You Are A GAMECHANGINEER

Game Changineer

Game Plant Show Hide Message

There are 40 carrots.

There are 10 foxes near the top,

There is a rubbit near the bottom.

When the left arrow is pressed, the rabbit moves left.

When the right arrow is pressed, the rabbit moves right.

When the up arrow is pressed, the rabbit moves up.

When the down arrow is pressed, the rabbit moves down.

When the rabbit touches a carrot the carrot disappears.

When a fex sees the rabbit it chases it.

