11th International
New Materialisms
Conference
>

New
Materialist
Informatics
22–25
March
2021

ONLINE-CONFERENCE

University of Kassel, Germany

New Materialist Informatics
22-25 March 2021

PROGRAMME

Schedule

Date: Monday, 22/Mar/2021

10:00am - 1:00pm — **WS1: Workshop Session 1**
Please note that only those participants who explicitly registered to attend the workshops will be able to do so.

1:00pm – 1:30 pm — *Guided Tour through Gathertown space (meeting place: starting point in Gathertown)*

2:00pm - 5:00pm — **WS2: Workshop Session 2**
Please note that only participants who registered in advance and explicitly for selected workshops will be able to attend this session.

Date: Tuesday, 23/Mar/2021

9:00am - 9:30am — **Welcome: Opening of the Conference**
Session Chair: **Claude Draude**
Session Chair: **Goda Klumbytė**
Opening of the conference by organisers and a welcome by Prof. Dr. Susanne Maaß, ITeG Advisory Board member and professor at the University of Bremen

9:30am - 11:00am — **KN1: Keynote: Felicity Colman, "Notes on the Three Stages of the Algorithmic Condition; The Ethe of Mimesis, Feminicity, and Bioinformatics"**
Session Chair: **Goda Klumbytė**
Keynote by Prof. Felicity Colman, University of Arts, London, UK. Response by Dr. Beatriz Revelles Benavente, University of Granada, Spain

11:00am - 11:30am — **Coffee Break**

11:30am - 1:00pm — **PS-1A: New Materialist Informatics: Theories and Concepts (1A)**
Session Chair: **Ulrike Tikvah Kissmann**

11:30am - 1:00pm — **PS-1B: New Materialist Informatics: Theories and Concepts (1B)**
Session Chair: **Doris Allhutter**

11:30am - 1:00pm — **PS-1C: New Materialist Informatics: Theories and Concepts (1C)**
Session Chair: **Natalia Avlona**

11:30am - 1:00pm — **PS-1D: Between Type and Recursion (1D)**
Session Chair: **David Gauthier**

1:00pm - 2:00pm — **Lunch Break**

1:00pm - 1:30pm — *Guided Tour through Gathertown space (meeting place: starting point in Gathertown)*

2:00pm - 3:30pm — **PS-2A: Transdisciplinary Methodologies and Interventions (2A)**
Session Chair: **Julie M. Funk**

2:00pm - 3:30pm — **PS-2B: Transdisciplinary Methodologies and Interventions (2B)**
Session Chair: **Lissa Holloway-Attaway**

2:00pm - 3:30pm — **PS-2C: Transdisciplinary Methodologies and Interventions (2C)**
Session Chair: **Patrick Gamez**

2:00pm - 3:30pm — **PS-2D: Transdisciplinary Methodologies and Interventions (2D)**
Session Chair: **Julia Polyck-O'Neill**

3:30pm - 4:00pm — **Coffee Break**

4:00pm - 5:30pm — **KN2: Keynote: Shaowen Bardzell, "Muddled Theories and Vibrant Mud: Notes on a Career of Reading and Walking"**
Session Chair: **Claude Draude**
Keynote by Prof. Shaowen Bardzell, Penn State University, USA. Response by Dr. Anna Croon, Umeå University, Sweden.

5:30pm - 6:00pm — **Coffee Break**

6:00pm - 7:30pm — **D-1: Fix My Code – Presentation of the E-Book**
Session Chair: **Magdalena Tyzlik-Carver**

6:00pm - 7:30pm — **D-2: Demonstrations (2)**
Session Chair: **Selena Savic**
Demonstration session is dedicated to presentations and discussions with the authors. Demonstrated works will be accessible online throughout the conference.

Date: Wednesday, 24/Mar/2021

9:30am - 11:30am — **RT-1: Round-Table Discussion: "Speculative Materialities, Indigenous Worldings and Decolonial Futures in Computing & Design"**
Session Chair: **Goda Klumbytė**

	Session Chair: **Loren Britton** With contributions by: Dr. Outi Laiti, University of Lapland, Finland; Dr. Luiza Prado de O. Martins, Lusófona University, Portugal; Femke Snelting, CONSTANT, Belgium and Caroline J. Ward, Ada Lovelace Institute, UK
11:30am - 12:00pm	**Coffee Break**
12:00pm - 1:30pm	**PS-3A: Informatics of Domination and Beyond: Material-Informational Power and Its Effects (3A)** Session Chair: **Bettina Wuttig**
12:00pm - 1:30pm	**PS-3B: Informatics of Domination and Beyond: Material-Informational Power and Its Effects (3B)** Session Chair: **Pinar Tuzcu**
12:00pm - 1:30pm	**PS-3C: Informatics of Domination and Beyond: Material-Informational Power and Its Effects (3C)** Session Chair: **Corinna Bath**
1:30pm - 3:00pm	**Lunch Break**
3:00pm - 4:30pm	**KN3: Keynote: Aimi Hamraie, "Knowing-Making Accessibility: Crip and Unfinished Technosciences in Physical and Virtual Worlds"** Session Chair: **Goda Klumbyte** Keynote by Dr. Aimi Hamraie, Vanderbilt University, USA. Response by Dr. Katta Spiel, TU Wien, Austria.
4:30pm - 5:00pm	**Coffee Break**
5:00pm - 6:30pm	**KN4: Keynote: Safiya Umoja Noble, "Taking on Big Tech: New Paradigms for New Possibilities"** Session Chair: **Claude Draude** Keynote by Dr. Safiya Umoja Noble, University of California, Los Angeles (UCLA), USA. Response by Dr. Edna Bonhomme, historian of science and writer, Berlin, Germany.
6:30pm - 7:00pm	**Coffee Break**
7:00pm - 8:00pm	**D-3: Demonstrations (3)** Session Chair: **Hanna Wüller** Demonstration session is dedicated to presentations and discussions with the authors. Demonstrated works will be accessible online throughout the conference.
7:00pm - 8:30pm	**PS-3D: Contagious Life and Education's Erratic Encounters with Informatics (3D)** Session Chair: **Petra Mikulan**
7:00pm - 8:30pm	**PS-4D: Tackling the Carbon Footprint of Streaming Media (TCFSM): A Transdisciplinary Laboratory for New Media Informatics (4D)** Session Chair: **Laura U. Marks**

Date: Thursday, 25/Mar/2021

9:30am - 11:00am	**KN5: Keynote: Maaike Bleeker, "New Players on the World-Stage: A New Materialist Approach to Robotics and HRI"** Session Chair: **Goda Klumbytė** Keynote by Prof. Maaike Bleeker, Utrecht University, the Netherlands. Response by Dr. Pat Treusch, TU Berlin, Germany.
11:00am - 11:30am	**Coffee Break**
11:30am - 1:00pm	**PS-4A: New Materialist Design and Praxis (4A)** Session Chair: **John Hondros**
11:30am - 1:00pm	**PS-4B: New Materialist Design and Praxis (4B)** Session Chair: **Nancy Mauro-Flude**
11:30am - 1:00pm	**PS-4C: New Materialist Design and Praxis (4C)** Session Chair: **Jueling Hu**
1:00pm - 2:00pm	**Lunch Break**
2:00pm - 3:30pm	**PS-5A: Ethics, Aesthetics and Futures of New Materialist Informatics (5A)** Session Chair: **Waltraud Ernst**
2:00pm - 3:30pm	**PS-5B: Ethics, Aesthetics and Futures of New Materialist Informatics (5B)** Session Chair: **Jack Warren**
2:00pm - 3:30pm	**PS-5C: Habits of Collaboration (5C)** Session Chair: **Iris van der Tuin**
3:30pm - 4:00pm	**Coffee Break**
4:00pm - 5:30pm	**KN6: Keynote: Wendy H.K. Chun, "Authenticating Figures: Algorithms and the New Politics of Recognition"**

	Session Chair: **Claude Draude**
	Keynote by Prof. Wendy H.K.Chun, Simon Fraser University, Canada. Response by Dr. Aristea Fotopoulou, University of Brighton, UK.
5:30pm - 6:00pm	**Closing of the Conference**
	Session Chair: **Claude Draude**
	Session Chair: **Goda Klumbytė**

Abstracts

WS1: Workshop Session 1

Please note that only those participants who explicitly registered to attend the workshops will be able to do so.

What is Feminist Hardware? Feminist Hacking: Building Circuits as an Artistic Practice

Stefanie Wuschitz

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We are a group of female* art based researchers that will intervene in the hardware production cycle by connecting with ethical hardware manufacturers. We will work in a systematic manner with manufacturers who are specialized in open and ethical hardware to find as many fair sourced hardware components as possible. In this workshop we propose to experiment with circuits that consist entirely of these special materials we have collected in recent months. We believe the development of individual positions through collaboratively developed hardware to be the most appropriate way to demonstrate what feminist hardware entails. This methodology aims to support, on the one hand, the production of new knowledge acquainted by the interaction between artists, hardware developers/manufacturers, and, on the other, the playful prototyping with fair traded open hardware.

CONSTRAINTS AS CHANCE. ON ONTOLOGICAL PROSPECTS OF MATERIAL, INSTRUMENTAL AND OPERATIONAL BOUNDARY CONDITIONS FROM DESIGN TO SCIENCE

Frank Bauer[1,2], Maxie Schneider[3,4]

[1]Cluster of Excellence "Matters of Activity. Image Space Material", HU Berlin, Germany; [2]Department of Digital and Experimental Design, Institute of Architecture and Urban Planning, UdK Berlin, Germany; [3]Academy of Art and Design Weißensee; [4]Department of textile and surface design; f.bauer@udk-berlin.de

The workshop is conceived as an experimental encounter on ontological foundings and prospects of digital workflows. It nurtures new understandings of the co-authorship of those materials/instruments/operations at our disposal – opening perspectives on how scientists and designers may render them more productive at large through a little change of viewpoint.

An introductory 1st session applies the context of recent techno-anthropological research on the matter; which, coming from Actor-Network-Theory, revealed the roles of manifold, human and non-human agents (materials/processes/interfaces) (Latour 2011) and the importance of collaborative and uncommon practices across distributed agencies (Rheinberger/Krauthausen/Nasim 2011). More specific, the media philosophical concept of 'operative ontologies' will suggest how manifold ontological operations of making result in just as manifold forms of being (Engell/Siegert 2017).

In the 2nd session we collectively exemplify this on two cases: (A) How software-driven design is facing the question of projective distance, i.e. whether CAD/CAM bridges gaps of building or how these gaps are just dislocated into the everyday realities of office work; and how, while not so long ago, designers were facing the bottleneck of translating intent to clients or craftsmen, fabricational constraints have emerged as the manifold choking points of so-called 'digital chains'. (B) A joint assessment of examples from the younger scientific history presents the co-authorship of their related instruments, softwares and materials for academic progress.

Throughout the 3rd session, the participants share tools/interfaces/materials and respective constraints from their own (scientific/designing/professional) workflows. Short inputs on respective boundary conditions are followed by extra-disciplinary perspectives on them by the group. Such instances of looking on routines off routine, so to say, may fertilize a joint inquiry how unbiased attention may reveal unexpected epistemic potentials – eventually shifting technological discourses from possibility to constraint space.

WS2: Workshop Session 2

Please note that only participants who registered in advance and explicitly for selected workshops will be able to attend this session.

Inquiring the digital interstice through a data sprint: Ethnographic research where front and back end meet

Laura Kocksch[1], Stefan Laser[1], Fabian Pittroff[2], Jakob Roschka[2], Estrid Sørensen[1]

[1]Ruhr University Bochum, Bochum; [2]University of Kassel, Germany; pittroff@uni-kassel.de

Our proposed workshop tackles a key distinction of everyday life with digital data: the "front" and "back end." This distinction marks not only interconnected layers of programming but also diverse approaches to digital infrastructures. The front/back dichotomy has performative effects: they become different contexts for understanding and dealing with data in distinct ways. These contexts found divisions of labour and expertise and keep data practices apart.

How can ethnographic methods help in following and attuning to the performance of the front/back dichotomy? Our workshop will focus on the indeterminate space and time between the front and back end. The goal is to address flows, impasses, tipping points, where actors switch from the "front" to the "back". On the one hand, we will explore how the division between front/back end shapes data practices, their separation and interconnectedness. On the other hand, we will discuss how data flows and data practices challenge the front/back division.

For our workshop, we'll provide data alongside short inputs from two exemplary case studies to trigger a collective discussion and group interpretation. The workshop thus follows the structure of a "sprint" method. The goal of this data sprint – an intensive research workshop where participants from different background work together on a set of data and research questions – is to prototype research tools to make sense of digital situations that span beyond front/back ends. Time-wise, the workshop is divided into short empirical inputs on the one hand and extensive group work on the other. We will use (auto)ethnographic data as well as digital data produced by users and machines. Our research emphasises how data flows, database architectures and organisational structures are mutually shaped and how changes in one have considerable effects on the others.

Queering Narrative Structures in computational studies from the perspective of art education

Konstanze Schütze[1], Martina Leeker[2]

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Our transdisciplinary research lab is an invitation to think together and to develop a first draft for understanding artworks as a constellation within the postdigital condition, allowing to create workshops for more reflexive programming with/for future computer scientists. To do so, we will focus on the complex interrelations of analog and digital devices with human textures and investigate the extent to which algorithmic operations condition and change the perception of the world. Within this collective research, we will focus on biased and segregative programming. Against this backdrop, artistically condensed material (e.g., audiovisual essay) is approached for alternative models of knowledge formation, modes of being with the world as well as ways of sensitive programming.

Practical hints:

• 15 participants maximum

• we will work in groups and your background in theory and practice will be consulted

• text formats and artistic video essays will be our material

• for preparation we will open a MURALBOARD, with further links to texts and artistic works after March 16th, 2021.

PS-1A: New Materialist Informatics: Theories and Concepts (1A)

New Materialist Informatics as Post-Peircean Subjectivation

Neal Thomas
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Rising to Rosi Braidotti's challenge, that we update models of the scholar-scientist for a posthuman world through a "defamiliarization of our institutionalized habits of thought," this paper considers the implications of a widespread reliance upon Charles Sanders Peirce's ideas about significance and reasoning.

In light of Bernard Stiegler's assertion that writing technologies possess logics of grammatization that structure our habits of thought , Peirce's existential graphs represent something of a bedrock for modern datafied life. Through techniques developed from out of his "synechistic" account of signs and reasoning, so-called knowledge and social graphs now underwrite our capacities to reason communicatively, and automatically, about people, things, documents, and events. Google's knowledge network reached 500 billion facts this year, for example, serving as a material-semiotic infrastructure for subject-object relations across its many services, including voice queries made through Nest devices.

Peirce's approach to sense has not gone without scrutiny though, especially for its assumption that we all voluntarily participate in the technical art of producing "settled" signs. As a potential ground for the performance of new materialist subjectivations, Peirce's evolutionary, community-consensus approach to signs has less to say about the transformative unsettling of knowledge, through the intrusive force of the new, which may existentially disturb and disrupt through irreconcilable dissensus, among the differentially embodied. Paraphrasing James Williams on the limits of pragmatism, we want to be able to organize our truths not just so that they are subject to revision, but so that they can be perpetually called into question in a more fundamental way.

Relying on thinkers who critique, extend, and/or transform Peircean metaphysics wholesale, this paper considers ongoing cultural dilemmas around social computing—political polarization, the creeping commodification of discourse—in light of what a post-Peircean approach to information might entail.

Human-Machine Intra-action on Grounds of Flesh: Agency in the Work of Merleau-Ponty and Irigaray

Ulrike T. Kissmann
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The concept of intentionality in the tradition of sociology of knowledge, that has been formative for qualitative research methodologies, does not only rely on the idea of two separate minds, but also on a linear concept of time with the ordered succession of past, present and future. Although efforts are currently made to integrate bodies and things, agency still rests upon the notion of temporal continuity. Within such a framework, the acquisition of habits is intrinsically tied to former experiences of an ego. As time is conceived as continuous, the past is only considered as former present. Hence, habitualizations, that are of crucial importance for human-machine intra-actions, only gain meaning as rationalization of embodied memory. In contrast, Merleau-Ponty's late work is based on a nonlinear idea of time. In "The Visible and the Invisible" (1964/1968) the author develops a temporality that is generative of meaning. The article shows that habit formation becomes an open-ended process with no foreseeable end, with diversions, a zigzag with discrepancies. Besides the past as former present, the past is also made up of the "immemorial" or the unconscious. Together with Luce Irigaray's work "An Ethics of Sexual Difference" (1993) that draws upon Merleau-Ponty's ontology of flesh it is argued that fleshly temporality enables the subject-object divide, i.e. sentient and sensed entities. Flesh fosters an intentionality that is conceived as "fungierend". As it means in the context of functioning, the entities are no longer interested in how they can understand each other. Instead, they are interested in the task or function that they have to fulfill within the world. It will be demonstrated that this approach is more suitable for the empirical analysis of human-machine intra-actions.

MANIFOLD SPACES AND PATTERNED POTENTIALITIES

Yota D. Passia, Panagiotis Roupas
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While the continuous flow of events - within the ecological framework - seems to be a given, we still cannot trace the possibility of particular events prior to their emergence or calculate conditions of appearance. The research attempts to reconceptualize the built environment as living continua in continuous variation mapping "objects that come into being, as they emerge from continuous fields of media-material and then dissolve again into those fields" (Sha 2013, p.90). The scaffolded approach we propose is a mode of articulation for intensity and transformation as other modalities of spatial relations and structural dynamics. The cybernetic control is replaced by a topological field of emergence, an "anticipation apparatus" that recursively calculates differentials and uncertainties.

To that end, the research uses Ch. Alexander's 65 invariant Design Patterns, as presented in his book, A Pattern Language: Towns, Buildings, Construction. To map the virtual reality of space, the concept of a Deleuzian multiplicity is introduced, a philosophical concept equivalent or close to a mathematical manifold. Manifolds represent continuous and continuously varying fields as an approach to articulate objects as they shape and dissolve in those fields. As the manifold's architecture gets progressively defined, Alexander's invariant patterns organize a relational field of emergence where space is perceived as assemblages of variables and specific Design Patterns explain its possible mutations.

The manifold becomes the differential field of potential transformations, the structure of spaces of possibilities that maps the intensive morphogenetic processes of space based on their differential becoming. Through the anticipation apparatus, it is possible to explain how space changes in relation to networked patterns of communication between its elements, themselves variable entities. At the same time, articulate space as a field of connectedness composed of nested fields of connectedness where change can be perceived as immanent, and relational while space itself becomes intensive.

Creative abstraction: The role of abduction in machine speculation

Elizabeth de Freitas

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This paper develops philosophical insight into machine speculation, by focusing on the nature of abstraction in deep neural net algorithms. Following Buckner (2019), I discuss how machine abstraction is a process that involves more than subtraction of 'nuisance' features. I show how such algorithmic processes can involve a capacity to synthesize and compose, perhaps revealing "the alien becoming of thought" or "the inhuman becoming of thought" (Parisi, 2019, p. 106). I discuss recent work in studies of contemporary computational media that suggest abduction is a speculative mode of reason found in current algorithmic architectures, a form of inference that brings forth the unscripted new, in response to unanticipated and contingent conditions (Fazi, 2019; Parisi, 2019, Negarestani, 2015). Abduction is an inference that generates hypotheses and educated guesses, and can be characterized as "plausible reasoning" (Cellucci, 2017). The material loops of habit and anticipation are pivotal in abductive processes. Abduction always loops into a circuit of correction of the habit of habit forming, balancing chance and habit in a cognitive milieu that is more-than-human, stretching outside the control of the organism (Levesques, 2018). Zalamea (2012) defines abduction – through Charles Peirce - as an inferential process that locally glues the breaks in the continuum of habit and expectation. To abduct is both a creative gesture and a mode of regulation, smoothing over the interruptions to any generalization or abstraction, whilst creating non-linear contortions that might also disrupt previous pattern-making habits. Following Zalamea's (2012) claim that abduction must draw from an "infinitude of useless hypotheses" (p.102), I explore the ways in which this approach might be relevant to the error landscape of contemporary AI deep learning (Roffe, 2014).

PS-1B: New Materialist Informatics: Theories and Concepts (1B)

Time: Tuesday, 23/Mar/2021: 11:30am - 1:00pm
Session Chair: Doris Allhutter

Mapping feminist new materialist matterings for response-able practices in participatory design

Suvi Pihkala[1], Helena Karasti[2]

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This paper is an exploration of the affordances of the material-discursive notion of response-ability (Barad, 2007; Haraway, 2008) for reimagining participatory design (PD) in a new materialist and posthuman landscape. PD is a practice-engaged field that is invested in the democratic engagement of users in designing their sociotechnical realities and is most prominently driven by social democratic visions and human participants. In recent years, inspiration from sociomaterial thinking, feminist technosciences and Actor-Network Theory—among others—has created a space within PD for ontological concerns, which has re-animated pertinent questions of who and what else counts as a participant in PD; whose concerns matter beyond those of humans; and how engagement with and for plural, possible and more liveable more-than-human world(ing)s might be fostered. In this paper, we participate in these discussions and slow down to consider how the ontological approaches these discussions suggest can disturb and help recalibrate the politically and ethically inspired participatory practices of PD. For the purposes of this presentation, we focus on the researcher–designer as the 'protagonist' of responsible and accountable participatory practices and consider the works of Karen Barad and Donna Haraway and particularly their formulations of always-ethical relationality—response-ability—in mapping how feminist new materialisms might matter for PD. We maintain that response-ability can help us to unsettle the pre-eminence of the autonomous, reflexively aware researcher–designer enacting PD's participatory and democratic aims and to sketch an orientation of response-able engagement for PD. Moreover, while new materialisms might challenge a radical rethinking, this paper also seeks to illuminate how response-ability can work as a care-full orientation: thinking with response-ability prolongs feminist imprints in PD, thus offering an affirmative and productive mode of engagement with what PD is, as a field, while exploring new materialist theories to imagine what else it could become.

Educational technologies as matters of care

Juliane Jarke, Irina Zakharova

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Within feminist studies and Science and Technology Studies (STS), scholars such as Puig de la Bellacasa (2017, 2011) or Mol, Moser & Pols (2010) have proposed a shift from matters of concern to matters of care. Here, matters of care are understood as more than a bodily practice, but rather as the configuration of 'care arrangements: that is, where care-work appears as distributed amongst people and things and where "delegations" [...] of tasks to things are also noted' (Criado & Rodríguez-Giralt 2016: 212-3).

Scholarship concerning educational technologies has so far not considered to what extent this analytical shift is productive for its critical inquiry. For example, educational practices (such as learning or teaching) are understood as 'matters of fact' that can be quantified by research on learning analytics. In response, critical educational scholars have foregrounded 'matters of concern' such as governance, inequality or privacy in their studies of educational technologies. In this paper, we propose to investigate educational technology (design and use) as 'matters of care', facilitating and enabling (new) care arrangements. We are interested in how educational technologies are configured as sociomaterial arrangements of caring for people, selves, schools, infrastructures, data and more.

The paper is based on a study of four school information systems, which are deployed in public schools of four federal states in Germany. We investigate how different school actors such as principals, secretaries, teachers, software developers and support personnel engage in care work – maintain, continue and repair data flows within their datafied schools. We critically reflect on how educational technologies render care work (in)visible and allow for new ways of caring, where data and technology become care-givers and care-receivers.

Octopus I: New Materialisms and the Individual

André Krebber

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One of the central and most exciting impulses that New Materialism as represented by scholars such as Karen Barad, Jane Bennett and Timothy Morton is the imbuement of matter with its own, distributed, diverse agency. Octopuses seem to be the perfect models and thought experiments for imagining such decentered agencies. Three fifths of their brain neurons and neuronal function is located in their arms. In addition, each arm is covered with hundreds of suckers – little suction cups with highly sensitive chemical receptors with which octopuses gain information from and about their environment. Together, this makes each individual arm a high-powered sensual perception and information processing device. Yet octopus-researchers are reluctant to confirm the image of a distributed agency. Instead, they emphasize the central brain that receives and processes most of the information in one central spot. According to them there is one, not many octopuses in those eight-armed bodies. Instead of a multiplied octopus consciousness they recenter it into a single perspective.

Confronting new materialist concepts of material agency with the octopus, my talk explores and thinks through questions of agency and more precisely that of the relationship between individuality and agency, and discuss these against the background of information networks. Is the octopus an I? What quality is this I? Is it an individual? Or several Is? And, if we consider the processing of information within informatics under the lens of a new materialist agency: What does the octopus's case of processing information between its arms and its central brain tell us about the behavior of information networks and especially the role of individuals, and different individuals (as in arms vs. central brain) within these networks? Lies agency indeed with the networks, or do octopuses suggest a different distribution of agency among individual components of an information network?

Infrastructural Power and Deconstructive Computing: onto-epistemic interventions

Doris Allhutter

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My contribution introduces the concept of 'infrastructural power' (Allhutter 2019) and sketches a critical theory of computing practice connected to a design methodology informed by new materialism.

Based on Karen Barad's concept of material-discursive performativity and Brigitte Bargetz' (2016) queer feminist theorizing of affective politics, the talk develops the notion of 'infrastructural power'. This concept takes account of the multi-layered and dynamic socio-material entanglement of dynamic as well as structural power relations that emerge with practices of computing.

Using examples from my ethnographic study on computing practices in the field of 'fairness in machine learning', I elaborate on the onto-epistemic character of concepts and methods applied in this field. Practices in this field rely on infrastructural resources (such as training data sets and ontologies) that are built by humans and (semi-)automated processes; they take place in multidisciplinary settings including computer scientists, scholars in law, social sciences and ethics, and are also driven by data-rich technology companies. Notably, human-machine assemblages, epistemic communities and communities of practice are differentially entangled in social power relations, yet they feed on each other and are materially and discursively intra-active. In my talk I want to discuss the consequence that such a framing of technoscientific development may have for a critical theory of computing practice. And eventually, I suggest that deconstruction provides a useful methodology that strives to intervene into design practice by making visible its implicit normativities, sense-making, and ultimately world-making (Allhutter 2012).

Allhutter D. 2019. Of 'Working Ontologists' and 'High-quality Human Components'. The Politics of Semantic Infrastructures. In DigitalSTS: A Field Guide for Science & Technology Studies, Princeton and Oxford: Princeton University Press, 326-348.

Allhutter D. 2012. Mind Scripting: A Method for Deconstructive Design. Science, Technology & Human Values 37(6), 684-707.

Bargetz B. (2016) Ambivalenzen des Alltags. Neuorientierungen für eine Theorie des Politischen, Bielefeld.

PS-1C: New Materialist Informatics: Theories and Concepts (1C)

Time: Tuesday, 23/Mar/2021: 11:30am - 1:00pm
Session Chair: Natalia Avlona

Ontology Explorer: A method to analyse data models for identifying and registering border crossers

Wouter Van Rossem[1], Annalisa Pelizza[1,2]
[1]University of Twente, Netherlands, The; [2]University of Bologna, Italy; w.r.vanrossem@utwente.nl

Database schemas, interfaces and ontologies can enact actors in politically sensitive ways. This manifests clearly when such formal knowledge representations are used to establish intended identities of non-citizens. In this paper we present results from our semantic and computational analysis of ontologies of information systems used to identify and register migrants in Europe.

By launching the "hotspot approach" in 2015, the European Commission has identified the use of information systems as an important element to de facto achieve a joint migration policy and to gain knowledge on non-EU citizens. However, differences (and similarities) exist among members states' systems, as well as between member states' and Europe-wide systems. At European level this is especially relevant as information systems are undergoing major changes following several proposals to make them semantically interoperable, and make their data more usable for EU policy-making. How then are migrants enacted by information systems designed for different purposes by different institutional actors? And what consequences are entailed by their ongoing integration?

We present our method to analyse ontologies used in information systems aimed at identifying and registering people at border. This method is informed by discourse and network analysis, allowing us to make visible the politics of knowledge production and materialities of information. We introduce results from our comparative analysis of operational information systems used at EU hotspots. This method will contribute to scholarship in digital STS and the materialities of information with a new method based on the empirical analysis of ontologies.

Tracing the conceptualization of data infrastructure using text mining: Japan's "information bank" system

Harald Kümmerle
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This paper investigates how conceptions concerning data and information are situated in the political discourse on digital infrastructure in Japan. Using the framework of agential realism (Barad), technology policy is grounded in the material-discursive practices that take place in parliament.

The early strength of the Japanese computer industry during the 1980s was followed by a decline especially since the beginning of the new millennium, leading to strategies that are very distinct from other countries in the global North. They are highly techno-nationalist, prominently feature issues of trust, and envision the ASEAN countries as a site of competition among powers.

The above is well-known from the Japanese-language literature in the political sciences and economics. What new materialist informatics can provide is to assess in what ways material-discursive practices that concern data and information contribute to the emergence of such diverse phenomena. More classic issues of language do play an important role, as there is no clear correspondence between Japanese terms and data and information, and the inherently rhetorical nature of data practices (as known from Critical Data Studies) is thus reconfigured. More importantly though, it is the view that infrastructure and discourse are sedimented out of the non-linear space-time that gives deeper insights. As this process has unfolded over many decades in Japan, both entanglements on a global scale as well as the large variety of phenomena connected to digital technology inside of Japan have to be taken into account. As Japan is a representative democracy with a large bureaucracy, the minutes of the Diet give account of the material-discursive practices relevant to discourse to digital technology and infrastructure. Text mining these minutes and reading the concepts of data and information diffractively (Haraway), the creation of the system of information banks (jōhō ginkō) since 2017 is perspectivized and historicized.

Fluidics and materialist logics.

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With the "return" to matter and the call for re-evaluating its processes in new materialist thought we also witness a parallel resurgence of computation design paradigm from the 50's, namely, fluidics – in the form of micro-fluidics.

Developed as a form of computation that could operate under the threat of an ionized environment (during the 'Cold War hysteria'), fluidics can be found in several domains from soft-robotics (octobot) to finance (MONIAC).

This presentation would like to further introduce and re-interpret some of the key components that make up fluidic computation, its materially constituted logics, its capacity to both operate analogically and digitally but without falling into the unfruitful dichotomy of 'analog vs. digital'. In fact, due to its onto-logical difference to present paradigms in digital computation, I believe that fluidics and its materialist logics would further enrich the conversation concerning new materialist informatics.

Informed by the several ongoing new materialist interpretations, but also by engaging directly with Susan Stepney's singular work in 'non-standard computation' along with a parallel close reading of Michel Serres' The Birth of Physics, this presentation would like to argue for an ontology of "the flow" in computation, whereby the process of computing is best understood materially as a continuous process of circulation.

Reconstructing Phenomenons by using the methodology of Objective Hermeneutics

Hanna Wüller
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New Materialisms offer theoretical perspectives, which can enhance our understanding about how „matter comes to matter". To transfer these insights into the design of hard- and software, we have to understand the intra-actions which may happen. Thus, empirical research is necessary to get to know phenomenons which may be influenced by the change. Currently used research

methods like Grounded Theory Methodology (especially the Situational Analysis by Adele Clarke) or ethnography focus on social structures emphasising interaction and culture in its situated social meaning.

In my talk I argue that Objective Hermeneutics by Ulrich Oevermann can be useful as well, as itallows to reconstruct objective structures which may have an effect in the examined phenomenon. Therefore, a sequential analysis has to be conducted. First the boundaries of a phenomenon are defined by setting a research focus. Second, one part after another is analysed by asking the following questions: What could happen next? What could be said and done instead? Which difference does it make, saying or doing exactly this or that? With these questions the objective meaning apart from the context is reconstructed and has to be set into context afterwards. Considering the context the structure of the phenomenon becomes visible. Third, the results of the sequential analysis are embedded into the research focus.

Using my doctoral thesis as an example, I show how the basic assumptions of New Materialisms can be combined with those of Objective Hermeneutics. In my research I use videos of intra-actions with occupational nurses and patients to show possible new insights into phenomenons by attending creation of human and more-than-human actors.

PS-1D: Between Type and Recursion (1D)

Time: Tuesday, 23/Mar/2021: 11:30am - 1:00pm
Session Chair: David Gauthier

Between Type and Recursion

David Gauthier[1], Alexander Wilson[2]

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We propose a mini-panel addressing the interlinked notions of type and recursion.

"Matter-Information-Observer" - Alexander Wilson, PhD

"Physics gives rise to observer-participancy; observer-participancy gives rise to information; and information gives rise to physics." - John Archibald Wheeler

The American physicist John Archibald Wheeler, who argued that science needed to embrace a loop between observation and nature in order to avoid infinite explanatory regress. The matter-information-observer (MIO) loop is a succinct way of construing Wheeler's notion of Participatory Universe. In this paper we confront the MIO loop to type theory. Due to the Curry-Howard isomorphism, it has been known for decades that there is a direct correspondence between computer programs and mathematical proofs or, in other words, that the theory of computation can be interpreted as type theory, and visa-versa. In the last twelve years, this historical trajectory has now also been linked to geometry and physics: building upon developments like the BHK interpretation of intuitionistic logic, Church's Typed Lambda Calculus, Kleene's notion of realizability, Martin Löf's constructive type theory, and functional languages like Haskell and proof assistants like Coq and Agda, the recent development of Homotopy-Type Theory, a new branch of mathematics being advanced as a theory of foundations, now provides a link between type theory and the geometries, symmetries, and geodesics central to understanding the material world (physics). The motivation for investigating this history in relation to the MIO loop is this: If all matter discloses itself in responses to yes-no questions, then it follows that all matter can be interpreted in terms of computability. Empirical nature does not disclose itself if the universe does not complete the computation of the "program" of our yes-no question. Each time an observer probes nature and solicits a response, the observer and the world are essentially enacting a kind of program, a series of operations for "constructing" the given expression of matter. In other words, following Turing's "halting problem", matter reveals itself as an object or event only if the enacted series of operations "halts" on a definitive construction. With its specific cognitive, physiological, and technical affordances, an observer of a given type can construct a given array of proofs, and thus has access to a specific spectrum of possible disclosures of matter. What we call "matter" may always be the proof of a certain observer's program, the element of a specific observer's type. A similar consideration forms the crux of David Deutsch's "constructor theory" according to which, since physics is ultimately quantum in nature, we can equate the "multiverse" with the allowances of quantum computability theory. These questions will be confronted with to the "non-terminating" programs that inhabit the bottom type in type theory, those operational procedures that do not halt, and which provide a computational basis for understanding the Leibnizian notion of "indistinct cognition".

"Recursions without Results" - David Gauthier

"What Hegel, the relevant interpreter of the entire history of philosophy, could never think is a machine that would work." - Jacques Derrida

Recursion is arguably one of the most important theoretical construct of the 20th century. The central role recursion played in the debates surrounding the foundation of Mathematics, namely with the works of Gödel, Church, and Kleene, is not only well known but indisputable, moving the fields of logics and mathematics to the modern era. Central to Church's Lambda Calculus, recursion directly connects to the fundamental notion of mathematical induction which is the cornerstone of arithmetic and set theory, or more generally, of the act of counting and enumerating. As Poincaré intuitively emphasised at the turn of the 20th century in his quarrels with the logicists (Russel, Couturat), induction is not only central to counting but also of performing mathematical proofs—an intuition that was formally demonstrated in the 1960s with the Curry-Howard isomorphism. After Church (Kleene and Rosser) we know that recursion (as a formalisation of induction) is intimately tied to the notion of function. Contemporary functional programming language, such as Haskell, Scheme, Coq, and Agda to name a few, are all based on recursion. It is through this construct that they define their types and perform computations/calculations. As logician Dowek explains in La Métamorphose du Calcul, with the formalisation of induction, mathematics and logic have moved from antiquated analytic and axiomatic paradigms into a recursive one based on a logic of calculation and performances—something we propose to label a logic of execution as opposed to the constative logic of results. In his treatise Recursivity and Contingency Hui draws a parallel between recursion and cybernetic feedback loops and frames recursion through Hegel's speculative logic. Hui's notion of recursivity can be read as a mean to institute a Hegelian movement of Aufhebung for computing machines based on the notions of feedback and individuation. What this speculative recursivity concurs to, we argue, is to assign machines a Hegelian-like self-referential spirit, a Selbst that would spectrally hover over the machine's operations. Such view on recursion will be problematised and critiqued. We will show that Hegel's speculative logic, based on his Aufhebung, is incapable of grasping mathematical and computational recursion proper since it is a penultimate example of a logic of the Result as Lyotard identifies it. In turn, we will argued that if computational contingency is to be approached, then the event of execution needs come into focus, that is, the necessary passage to action when instructions and results are effectively suspended.

PS-2A: Transdisciplinary Methodologies and Interventions (2A)

Endocode: Boundary Collapse in the Endocrine System

Julie M. Funk

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Endocode is a research-creation project that speculates how biomedicine's reliance on metaphors which imagine endocrinology as an informatics system can be made material. Through Endocode's creation component, which repurposes an AI-enabled ovulation tracker, these metaphors are actualized; biometrics measured by the device is woven into an interactive narrative which interrogates how endocrine informatics discourse aids in the construction of the biomedical/biomediated self.

Endocrinology is often organized as biological informatics systems in public medical communication. For example, the PBS webpage "How Do Hormones Work?" states that "hormones are *chemical messengers* that...*coordinat[e] complex processes*" (Dunn, emphasis added). The page goes on to describe hormones "communicat[ing]" to "respons[ive]" cells and invokes a final analogy of the endocrine system as sending out radio signals to eager receptors.

Informed by Donna Haraway's polemical statement, "biology *is* a political discourse" (203), this project does not outright reject communications which liken the endocrine system to informatics. Rather, it interrogates the boundaries of the endocrine system in public medical discourse and collapses such boundaries into "zones of implosion" (207). Using the Mira AI-enabled ovulation tracker, this project turns the device, which measures luteinizing hormone volume in urine, into an interactive physical computing narrative that demonstrates how actualizing the endocrinology informatics analogy produces and reproduces identities of ability/disability in reproductive technologies. The physical computing component of the project is comprised of a repurposed Mira and "wands" that have been used to track the author's low levels of LH. When inserted into the device, the wands comprise a 30-part interactive narrative. Each wand reveals information about the author's quantifiable biotraces and qualifiable/biomediated self.

Dunn, Kyla. "How Do Hormones Work." Fooling with Nature, PBS.org, 2014, https://www.pbs.org/wgbh/pages/frontline/shows/nature/etc/hormones.html

Haraway, Donna. "Morphing in the Order." The Haraway Reader. Routledge, 2004, pp. 199-222.

Towards a digital permaculture?

Nathalie Grandjean

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It is widely agreed to think that we have entered the "digital age". At the same time, however, others are convinced that we have entered the Anthropocene, an era of instability that threatens our way of life, ecosystems and therefore the survival of the human species. It is therefore very legitimate to question the possibility that our world remains digital if it suffers from extreme ecological devastation? How to think about the future of the Web and the digital at the time of the Anthropocene?

Our proposal will be more speculative than practical and will be inspired by the ethical principles of permaculture (Holmgren, 2014). Permaculture, both ethical and practical, is guided by three major principles: "take care of the Earth and all its forms of life, take care of people (...) and redistribute the surpluses (to the Earth and to people)". In addition, permaculture is not dogmatic, because it is the detailed observation of the "environment" and its interactions that will determine the particular design, specific and necessary for resilience. It is therefore not a question of applying principles on a terrain/soil, but of taking care of both the processes and the living people inhabiting this space. As Puig de la Bellacasa maintains, permaculture is an ethics of care, but also an a-subjective relational ethics, addressing humans and non-humans with the idea of taking care of living environments together, including humans and more-than-humans (2017, 161).

We will get inspired by this both ethical and practical model of permaculture in order to re-think the way digital objects and cultures should be designed and implemented.

Ecosystemic entanglements: a diffractive reading of Barad, Haraway and Hui

Nevena Ivanova

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In order to show how the nature/culture divide is collapsing in the notion of ecology as a cybernetic concept, I'll perform a diffractive reading between Haraway's situated knowledges and sympoietic kinships, Barad's agential cuts and intra-active entanglements and Hui's ideas of locality and cosmotechnics. Can we think of a shifting episteme, of a new sensitivity underlying all spacetimemattering due to the rising algorithmic logic, which turns the earth into an artificial technical system? How does computation contribute to a non-anthropocentric ecosystemic imagination of the unknown? While Haraway and Barad deconstruct anthropocentric autopoietic understandings of knowledges and worldmaking, what Hui contributes to the technofeminist discourse is the notion of multiple diverse forms of cosmotechnics - namely, the idea that technogenesis needs to be multiplied and diversified on the basis of local geographical and traditional epistemes.

Dataspace Energy: Viable Systems Design for the Green Transformation

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Sustainable energy creation is at the heart of a green transformation, and radically decentralized energy grids having to coordinate a wide variety of energy actors call for the design of collective intelligences mobilizing human and machinic agencies in such assemblages. Part of a wider exploration of collective intelligence design strategies, the essay outlines a viable systems design conversation and engages with new materialist thought to bring into view the multiple registers of this distribution of agency. While much research in economic and environmental justice has focused on the material impact of communication infrastructures (conflict minerals, occupational health and safety across electronics supply chains, electronic waste), we focus on the role of data in the "green transition" and the imagination of dataspace design strategies. Following an introduction to

"dataspace design" as our methodological framework, our analysis of key examples from the "dataspace energy" is framed by a relational understanding of infrastructure, cosmopolitical considerations of the ecology of objects, and attention to the dynamic geopolitics of energy. A particular emphasis is placed on cooperative approaches - from citizen energy cooperatives and decentralized microgrids to data unions facilitating the co-creation of value. We explore this dataspace energy as a conceptual, methodological, and political sandbox for viable systems design and new forms of human-machine collaboration. Rooted in the cybernetic cultures of arts-and-technology research, we contend that conflicts about "nature" can be usefully reframed as conflicts over different data-based modelizations of what we mean by nature. We therefore conclude this exploration with a critical assessment of the future role of dataspace design in the European Union's "New European Bauhaus" initiative that has called for a new conceptual architecture for the integration of ecological, cultural, and technological dynamics.

PS-2B: Transdisciplinary Methodologies and Interventions (2B)

Time: Tuesday, 23/Mar/2021: 2:00pm - 3:30pm
Session Chair: Lissa Holloway-Attaway

Playing Cat's Cradle with Assistive Technologies: A Feminist-Materialist Tool of Intervening in and Re-Figuring Human-Machine Relations.

Pat Treusch

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The Global North is densely populated with assistive technologies – from Chatbots to Smart Home Assistants to Robot Companions, stepping out of factory halls. They can be read as a continuation of the historically long-standing attempt to create artificial interlocutors. From a humanistic perspective, what appears to be at stake is to negotiate the status of the human-like, the implications of such machines for societies with regard to how they should behave towards 'us' , and how 'we' should behave towards them. This shows in multiple debates, e.g. on robot rights.

However, what appears to be inevitable is that the increasing introduction of assistive AI devices into 'our' human everyday lives is defined through relations that are comparable to those between humans. Ongoing research points out how the human-like perpetuates the logic of 'modern man', e.g. through the colonial and racist master-slave metaphor or the gendered and sexist infant-caregiver metaphor, both heavily used to define human-machine relations.

This paper suggests to radically challenge the human-like as a frame for AI devices through Haraway's game of cat's cradle (CC; 1991). Following the yarn as metaphor and material, allowing generative nodes and new patterns of meaning and mattering to emerge, is a performative approach towards relations as an intra-active and affective doing. This encompasses a shift from (re-)installing human-like relations to analyzing and enacting intra-subjective/intra-objective dynamics, affects and the embodiedness of such a relating in situ. Being affected then becomes not only the centralized practice of relating, but also key to subverting normative relations along the identification of the human self in the human-like Other. Working through the example of "Robotic Knitting" (2020), I will present insights into the implementation of CC in a robotics lab to develop it further as a tool for creating interdisciplinary, feminist-materialist assistive tech cultures.

Theory as inquiry, exploring the potential of post-qualitative computing education research

Magda Pischetola

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In the last decades, critical studies, techno-feminism and new materialist perspectives have called attention to how computational technologies are designed, produced and disseminated. It has been shown how specific philosophical traditions drive knowledge production through computing (Britton et al., 2019) and how analysis of power relations in this field can contribute to expand critical thinking (Bardzell, 2018), redefine conceptual boundaries (Breslin, 2018), as well as give voice to underrepresented groups (Ashcraft et al. 2017). Against this backdrop, questioning technology becomes an obligation for researchers (Bødker, 2003), as it makes visible the existing configurations among narratives, discourses, bodies and imaginaries (Haraway, 1991).

To this day, little attention has been given to higher education students' initiation into specific procedures and practices of computing research. In this paper, we propose to address this topic through post-qualitative inquiry (St.Pierre, 2017; Taylor, 2016), which relies on theory as method (Springgay and Truman, 2018) and understands research as world-making (Adam and Thompson, 2016).

Inspired by feminist science and technology scholars (e.g. Haraway, 1988; Johnson, 2010) and new materialist theorists (e.g. Barad, 2007; Braidotti, 2016), we aim at using post-qualitative inquiry to shed light on hegemonic discourses and situated/embodied research procedures among undergraduate students. To do so, we explore modes and methods of knowledge production during a process of supervision of a bachelor project about gender inequality in Computer Science.

Diffractive reading (Lenz Taguchi and Palmer, 2013) and intra-action (Barad, 2007) between researcher, supervisors, subject matter and the institutional setting are experimented with the students along the supervision. Simultaneously, theories and discourses underlining computing education practices and assumptions are mapped through a cartographic process. Finally, a narrative (Rosiek and Snyder, 2020) is presented as result, which shows the potential of post-qualitative practices in generating open-ended research processes and non-standard procedures of knowing in computing education.

Playing in and Becoming-with the Cauldron: Speculative Queer Feminisms in the Games Classroom

Lissa Holloway-Attaway, Rebecca Rouse

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In spite of many feminist and queer interventions in the games field at large (Chess, 2020; Ruberg, 2019; Gray, Voorhees, & Vossen, 2018; Shaw, 2015) and in the games classroom (Rouse & Corron 2020; Flanagan, 2009), the project to revolutionize games pedagogy in radically queer and feminist ways has largely not (yet) succeeded. Rooted in instrumental approaches to games as simplified technologies, separated from complex socio-cultural-technical spheres of material influence, games pedagogy often reinforces structural oppressions where created and circulated, both in academia and culture at large. Feminist scholars such as Sarah Sharma (2020) remind us of the subversive wisdom in not "fixing" the brokenness in patriarchal structures, Instead they invite us to revel in the mess and stay with the trouble (Haraway, 2016). They encourage intra-active and diffractive methods (Barad, 2007) that lead us to build anew outside established institutions, entangled in game cultures that don't easily resolve into neat information systems and meanings.

With this messy history in mind, we envision possibilities for reconsidering game pedagogies and the games and players with which they become. We consider game/cultures as dynamic techno-cultural storyworlds with powerful ecosystems of influence. Our approach carries us beyond systemic problems associated with games: burnout, lack of support (personally and institutionally), and an absence of deep structural change. Just as games invite explosive action, we suggest blowing up current paradigms of games/games education to imagine a new emergent, transformational pedagogical storyworld, beginning very early in childhood education, and carrying through to university, and onwards. We suggest the cauldron as a boundary object to center our play-full speculative future, one achieved through stirring the pot, coming together, becoming-with, through material

storytelling and creating strange brews. Our cauldron centers us and keeps us looking into the fire, imagining and seeing beyond.

PS-2C: Transdisciplinary Methodologies and Interventions (2C)

Time: Tuesday, 23/Mar/2021: 2:00pm - 3:30pm
Session Chair: Patrick Gamez

Enframing or Animating Second Nature: Reflections on Cybersecurity and Ontology

Patrick Gamez[1], **Ziyuan Meng**[2]

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It can be a struggle for philosophers and engineers to engage with each other in good faith and in terms mutually intelligible to each other. As an engineer and a philosopher, we have at the very least a good deal of anecdotal evidence for this claim. So why the disconnect?

We propose that there is an ontological reason for this disconnect. Computer scientists engage with the infosphere instrumentally, reducing the agency of digital objects yet inert, fungible resources. Drawing on work by Luciano Floridi, Heidegger, and Hans Jonas, as well as contemporary figures like Latour, Yuk Hui, and Jane Bennett, to suggest that we might fruitfully view our information environments as a sort of "second nature," subject both to the same sort of "enframing" perspectives that Heidegger described in "The Question Concerning Technology" but similarly open to the same sort of animating, or animistic, or agency-rich interpretations of "nature" that have characterized much of new materialism and the "ontological turn" in anthropology and philosophy.

As our aim is to bridge a divide between engineer and philosophers in practice, we try to demonstrate that - despite the apparent "abstractness" of much ontology - this change in perspective can make meaningful differences to technical practice. So we look to the issue of cybersecurity. More specifically, we will look at the relatively common hacking practice of SQL injections, arguing that (a) it is genuinely helpful from a practical and technical standpoint to view these practices from an ontological point of view, and (b) to articulate the problematic ontological assumptions that foster these sorts of vulnerabilities. In particular, we argue that viewing the components of, e.g., an app reductively, as fully modular, instrumental, and inert, can lead to poor design choices, and a different ontological point of view may be called for.

SITUATING CAD/CAM – OR, ON THE ONTOLOGIES OF MATERIAL VERSUS MANUFACTURING DATA

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One generation ago, Friedrich Kittler cautioned how one should stop conceiving of algorithms as tools, and of computer-aided workflows as mere auxiliaries (2012[1994]), but acknowledge the very productivity of digital tool sets for processes of modeling, designing and fabrication. This paper renews his point, asserting that how the virtual seeks materialization in matter is not so different from how the imaginary has always before, while our understanding of these translations still misses to fully acknowledge distributed agencies at large.

In recent years, a positivist CAD/CAM discourse within architecture and the arts appears mainly fascinated with prospects for individual and authorial potency (Gramazio/Kohler 2014; Paul 2013). On the contrary, there is growing awareness for the relevance of inanimate actors, from machine to code, from manual to script (Zardini 2013; Panagiotis 2017). Assuming that those rapidly altering workflows of digital fabrication yet remain to be penetrated across disciplines, this talk offers a broad survey of instances where innovation has arguably emerged precisely apart from and beyond of efficiency and optimization.

At the closer example of CAD/CAM driven art production, it approaches the suggestive power of manufacturing models between theories on visual agency (Bredekamp 2017) and transmedial material literacy (Lehmann 2018). A comparison of modeling strategies from science to the arts in their common quest for so-called brilliance prepares an investigation into the cutting data generation for a sculpture by artist Peter Busk – which suggests how abandoning exhaustion for elegance may lead to alternative and relative forms of precision. As a preliminary case study to ongoing research on computational ontologies between the symbolic and the material, this paper is conceived as a preliminary inquiry towards the instrumental and operative foundings along such processes at large – eventually attempting to shift discourses on digital technologies from possibility to constraint space.

Code Machines -- Hatching Post-Capitalist Practices within Blockchain Economies

Michael Heidt

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The text seeks to deploy new materialist conceptions of code and data in order to rethink and redescribe the potentials inhering within Blockchain systems. Blockchains and other distributed ledgers are the technologies underlying systems such as the cryptocurrency Bitcoin, the smart-contract infrastructure Ethereum, or the Tezos distributed voting system. Other uses include automated carbon crediting systems, decentralized tracking of COVID-19 antibody test results, and peer-to-peer insurance.

Blockchain systems and other distributed ledger technologies thus constitute interesting formal elements within future socioeconomic machines, while the true extent of their potential remains hard to fathom. I propose reflecting on their material properties in order to give a productive account of their potential future status:

Crucially, they are made from code (as in source code) while emitting and requiring data. Code, however, possesses peculiar material properties. Its malleability depends on its capability to be continuously translated between different human and non-human actors, while its execution occurs irrespective of human agency.

Therefore, code itself has to be situated at the difference between mere (quantum-)mechanical apparatus (the computer), and its communicative machinic side. Data is understood as detritus, ejected by a machine before being further metabolised and fed back.

Code machines thus can be conceptualised as elements punctuating these exchanges (making them machines in a classical Deleuzian/Guattarist sense). Likewise, Distributed Autonomous Organizations invoke a peculiar mode of difference between bureaucratic apparatus and the creative machinic potentials of code and coding.

This new materialist understanding opens up a productive avenue for describing the potentials inhering within further intertwinements of coded infrastructures with the economy: Collective desires can translate themselves into the rules making up code machines, in turn reshaping and remodulating social patterns of desiring and making.

The perspective adopted is illustrated through a series of speculative design cases and deep reading of existing source-codes.

PS-2D: Transdisciplinary Methodologies and Interventions (2D)

Time: Tuesday, 23/Mar/2021: 2:00pm - 3:30pm
Session Chair: Julia Polyck-O'Neill

Potential Archives: How Digital Humanities and Feminist, Materialist Informatics Will Transform the Interdisciplinary Artist Archive

Julia Polyck-O'Neill

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Archival scholars have identified two interrelated contentions underlying current approaches to artists' archives within the present academic and archival milieu: systemic issues fundamental to archival conventions and practices, and shortcomings of formal organizational strategies within such practices. Feminist archival studies scholars Michelle Caswell and Marika Cifor argue that traditional archival practice is often rooted in colonial and patriarchal cultural and structural conditions. Deena Engel and Glen Wharton, scholars of artists' archives, have addressed how the limitations of conventional archival systems often fail to accommodate the kinds of information, accuracy, and logistical affordances scholars and art professionals require for their research. Specialists in feminist archival studies respond to such organizational shortcomings, observing how the practice of the co-creation of archives with the artist(s) represented within the collections can contribute meaningfully to the value of the collection for scholars and communities. Caswell and Cifor's proposal for a "feminist ethical framework" for archival studies situates the archive within the sphere of feminist materialism and materialist informatics, socially, materially, and culturally, with consideration of relational and affective contexts (24). The addition of autobiographical, narrative, and networked data and digital media forms enable increased access, and have the potential to transform the relationships between artist, archival institution, and user. Moreover, such approaches shift the way archives are conceptualized and understood.

Considering the possibilities inherent to feminist, materialist methods for rethinking the archive, Potential Archives is both a study and a framework, providing both a map of how these non-traditional methods have worked in the past, and a model for how to develop future artist's archives, reconceptualizing the interdisciplinary artist archive according to emerging material feminist and digital epistemologies and methods to help artists plan for and prepare their future institutional archives and address emerging needs and concerns, while also assisting arts institutions in addressing such innovations.

"Entangled-Methods"?: Diffractive Approaches for the Digital Humanities

Rabea Kleymann

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Mixed-method approaches are firmly established in the Digital Humanities. Usually, this is understood to be a combination of qualitative and quantitative approaches that are applied to an object of investigation. A premise of research inquiries with a mixed-methods approach is that they assume firstly that the complexity of the object of investigation is addressed via the plurality of methods used. Secondly, the approach is based on the idea that the research data obtained can be put into a coherent narrative. This "orthodoxy of integration" (Uprichard & Dawney 2019, 21), which plays an important role for the legitimation and development of new digital methodologies in the Digital Humanities, now forms the critical starting point.

In my paper, I introduce the concept of "Entangled-Methods" with reference to the material-semiotic methodology of diffraction proposed by Karen Barad. What new perspectives open up when we speak of "entangled" instead of "mixed" methods in the Digital Humanities? How can the disciplinary intersections of the humanities, design and computer science be renegotiated in this way?

In concrete terms, I discuss two use cases: On the one hand, I present "mixed-methods" approaches from digital literary studies and explore the possibilities of a diffractive framework of research data. How does the diffractive method fit into the hermeneutic setting? To what extent does the diffraction address the decolonization of the Digital Humanities? On the other hand, I consider prototyping as a concrete use case of discussing material stakes of inter- and intra-connectedness in the Digital Humanities: Understanding the software prototype as a multimodal "apparatus", I ask about its methodological role. This is accompanied not only by the issue of how knowledge is materialized in software, but also by the question of how working structures within the humanities and their material-semiotic forms of communication are changing.

Visualizing reading: a new materialist methodology to navigate through current political fictions.

Beatriz Benavente

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Katherine Hayles (2005) defines literature as an embodied materiality that performs an informative impact through her context of intermediation. In this sense, she conceives the text as a generative algorithm able to mobilize different meanings that engage with society through "making, storing and transmitting." Van der Tuin (2015) defines generation/generative as the feminist methodology able to trace the past while altering the future, a processual understanding of our contemporary genealogies. Feminism itself has proven to be a fantastic tool to produce analyses of differing traces that are modeling specific political fictions (Preciado, 2013) subjecting and performing different subjects and identities. The question at stake is being able to open feminist actions in order to alter our everyday experiences so that we can materialize a feminist material modal logics (Colman, 2020). Nowadays, virtuality, the digital, informatics and other material logics are shifting our cultural attitudes and networked identities and, perhaps, we are starting to fall into new forms of colonialisms in which the code reveals itself as the new lingua franca (Hayles, 2005). Visuality and the recently developed digital imaginary are creating new forms of reading that produce ontological separations between the knowledge that we create and the one that we receive (Valencia, 2018). I argue that one possible way to move beyond the analysis of these differing modes is by re-elaborating the concept of reading in this era of "psychopolitics, celebrity culture and live regimes" (ibid.) That is to say, the objective of this presentation is to generate the concept of reading in the informatics society in order to find feminist strategies able to alter our everyday relationships with social media.

D-1: Fix My Code – Presentation of the E-Book

Fix My Code – Presentation of the e-book

Cornelia Sollfrank[1], Winnie Soon[2]
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Download the book here: https://eeclectic.de/produkt/fix-my-code/

Two artist researchers from different generations, different cultural backgrounds and different skill sets engage in a dialogue about code as material, affective and other infrastructures, the need for collaboration, the productive side of dysfunctionality and gender aspects of technopolitics. The good thing, they do not just talk but actually also work together on this project: net.art generator [net.art-generator.com]. The net.art generator (nag) is a computer program that interactively collects and recombined material from the internet to create collage s. The easy-to-use program requires the user to enter a title which then functions as the search term, and to enter a name as author. The resulting images are stored online in an archive from where recent results can be downloaded. Conceived by Cornelia Sollfrank in 1998, the nag has created endless texts, websites, and images, and in parallel also generated a number of discourses – most notable in the context of authorship, copyright, and open source, which is why the piece has also been conceptualized as a "conceptual tool" or a "thinking tool." Eventually, after a change in policy (Google) in 2015, the nag could no longer generate new images. Therefore, Cornelia reached out to artist-coder Winnie Soon to collaborate on fixing the broken code. As both combine their artistic practice with a research perspective, the collaboration expanded beyond solving the technical problem to a discussion about broader cultural and techno-political issues. The process of troubleshooting, discussing, decision-making, and amending that followed produced a new discourse, which the two artist-researchers decided to be the next episode in the nag narrative and to serve as the basis for a new publication: Fix My Code.

D-2: Demonstrations (2)

Time: Tuesday, 23/Mar/2021: 6:00pm - 7:30pm
Session Chair: Selena Savic

Demonstration session is dedicated to presentations and discussions with the authors. Demonstrated works will be accessible online throughout the conference.

Materialism of Things

Franziska Andrea Seehausen

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https://materialismofthings.com/

The project "Materialism of Things" is a study of material behaviour, exploring its importance for future interface design and technology. Currently Interaction Designers face various challenges when designing human-centred interfaces, making available technology navigable and intuitive for the human. Material Designers in turn hold tremendous influence on society regarding sustainability and more within product design. Both fields strongly influence the functionality, perception and lifespan of an object when creating or choosing a material for a design. Through a material-driven approach that merges both fields we can examine existing electronic devices and their challenges in regards to sustainability and perception and explore "simpler" material-driven solutions.

The project thesis Materialism of Things (MoT), to be understood as an enhancement of the Internet of Things (IoT), is a new philosophical and theoretical outlook. It suggests that any simple and renewable material can be smart, responding to its environment depending on how it is understood, designed and how one interacts with it. It builds on latest activities and applications of smart and active materials and combines it with the theoretical principles of the philosophical discourse New Materialism, which states that material has agency and is intrinsically behaving and vital (Barad, 2003). Through the development of the applied design project Paper Gestures, that was developed in the context of the Master in Design through New Materials (ELISAVA), the principles of the approach are introduced and exemplified. Paper Gestures is a series of three responsive interfaces made out of paper that react to, and intra-act with, human behaviour and their direct environment. By doing so we can transform the ancient, previously passive and low-tech material into a dynamic, active and responding medium, serving as an example for material-driven interaction design.

Colonization Mechanism: Autogenerative Design Ecologies

Yota D. Passia[1], Panagiotis Roupas[2], Dimitris Skomvoulis[3]

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http://studioentropia.com/competitions/colonisation-mechanism/

Colonization Mechanism is a decision-making and planning-support tool for the transition of former lignite mining areas to urban agroecosystems. The programming strategy actively connects local communities - the socioeconomic environment, its actors and processes - with the physical environment - its developmental patterns and life cycles. Modeling them into an ecosystemic continuum generates more resilient, dynamic and adaptive urban agroecosystems from planning to management to construction. A machine-learning algorithm recursively selects, allocates and shapes the cropping system while at the same time constantly retrofitting its communication and transport network. Colonization Mechanism's innovation lies in the monitoring, visualizing and utilizing the environment's productive dynamics, pointing both to the local communities (biotic) and the physical environment (abiotic). By simulating environmental, economic and social dynamics in real-time, the mechanism algorithmically generates the optimal spatial and material organizations of urban agroecosystems.

Colonization Mechanism explains how and why space changes while visualising the spatio-temporal dynamisms that produce social relations and design ecologies. Critical parameters affect the becomings of space such as material, social, political, and economical transforms into maps of qualitative tensions to represent the textured gradient of their becomings. Mapping techniques are used to relationally measure each intensive variable as it fluxes between its maxima and minima. The resulting patterned gradients monitor the intensity of a spatial property, its patterns of behaviour, and critical points of change. Translating their textured gradients into geo-referenced information fields allows for their topological architecture to emerge. Colonisation Mechanism elaborates how entities contribute to the becomings of one another, affording and constraining possibilities of movement and interaction. It is an ecological infrastructure in the form of an interactive connected landscape that explains the production and consumption of the landscape as a nexus of communicating, overlapping, intersecting entities of continuous variation entangled in the various social, political, and material strata.

NOWARE

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NOWARE as Artwork lives online and displays the poetic result of artistic research in the field of material(ist) informatics. NOWARE explores the relationship between software and hardware. Within the work the question, if software knows how hardware looks like? is raised and followed. The research was conducted with machine learning tools in order to question if they could know about their own material conditions, which eventually consist of hardware components. AI Image generators were used to find images to firstly represent the limits of machine learning epistemology and secondly to further destabilise the imagined binary between software and hardware.

From their perspective one cannot live without the other. Their entanglement is compared to relationship of body and mind. The text is written from the position of the software, which allows for speculative fiction and creates a different subject(-ive) point of view. This is related to its existence in the digital and networked realm. This is a way to think about the actual connections our devices are making, while also being bound to the physical location of the networked sphere. This shift enables a setting, which invites viewer to reflect on their habits and experience, while have to scroll on their device to engage with the work.

PS-3A: Informatics of Domination and Beyond: Material-Informational Power and Its Effects (3A)

Brain-IT intersectional: a strategic movement to posthumanities

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The cyborgization of brainbodies with computer hard- and software today encompasses the realization of Brain-Computer Interfaces to the visions of Mind Upload to silicon, the latter targeting towards a posthuman future. From a feminist materialist perspective this field of Brain(?Human?)-Computer(?Techno?)-Intraactions appeal to a range of questions concerning the agencies within these phenomena, the transgressions of subject-object and culture-nature boundaries through their realizations, their impacts within bio-techno-socio-cultural entanglement as well as their intersectional taming.

In this paper, and based on my previous work on agencies, transgressions, realizations, and stubbornness of BrainBodies-in-TechnoCultures (Schmitz 2012, 2016, 2017), I will focus on the latter fragment of intersectional taming of these phenomena. Gaining at a feminist materialist guided political momentum (Coole 2013), I will work out the neuro-posthumanist agenda that targets visions of emulsion of the abled, successful, white, masculinized techno-brain–with competition as the normative capacity, masculinised rationality as the to-be-enhanced and feminised emotionality as the to-be ignored (Schmitz 2016). These visions and first realizations call for a deeper intersectional analysis about whose lives should be improved and whose lives should be excluded from neuro-posthumanism.

I will use and adapt Cecilia Åsberg's perspective of posthumanities, a "philosophy and sciences informed by advanced cultural critique and some seriously humorous feminist creativity […] and inventive feminist materialist philosophies" (https://posthumanities.net/om/), to formulate a concept of neuro-posthumanities that could be realized otherwise than by targeting heteronormative and intersectional '-isms' (as in neuro-posthumanism). I'd like to envision and discuss a material-discursive strategy which could encompass dimensions of affect, sociality, resistance, compassion, cultural diversity, ethnic diversity, multiple sexes/sexualities, aging, dis/abilities–in short, all this "intersectional stuff"–as well as stubborn techno-brain agencies and contumacies into these cyborgian futures.

Is the KSK Soldier a HumanMachine? A Study on the Materialities of Combat, Masculinity and Technological Enhancement

Bettina Wuttig
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This paper investigates the entanglement of combat practices of special forces, concepts of masculinity and race, (imagined) technological enhancement and corporeal materiality. The term "corporeal materiality" is used in reference to Friedrich Nietzsche's and Gilles Deleuze/Felix Guattari's vitalist materialisms, the development of this concept by new materialist thinker Elisabeth Grosz and the Soma Studies, a vitalist materialist research perspective founded by scholars of the University of Marburg, Department of Education, and the University of Jena, Department of Theoretical Sociology (Wuttig 2016; Gregor 2015; Spahn 2020). Soma Studies address the question of how social order inscribes itself into a somatic dimension, furthermore the consequences of human-technologies-interdependencies concerning the building of a (biased) collective sensorium (see also Paterson 2008). Along the example of experienced and imagined high tech combat of KSK Soldiers (Kommando Spezialkräfte/Special Forces in Germany) the question is raised: Which kind of 'new' gender and racially biased affective corporeal materialities are produced in (imagined) situations of high tech combat? Can these (new) affective qualities be described as fearing machine assimilation?

Escaping a Galaxy of Ringed Fences: Ending the "Binary" with Quantum Queer Theory

Erin K Stapleton
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When Ada Lovelace wrote the elegant algorithm that would eventually lead to the possibility of computation, using human attributes to sort bodies into value-laden categories was already an established idea. Colonial ambitions had cemented a rigidity in the understanding of racial hierarchies, and by extension, those of gender and sexuality. Categories that describe humans, and express prejudice, rely on comparison, and by extension, discrete data. One category is better than the other, and there is no possibility that a body can be both, or neither. In other words, the notorious "binary" (or more accurately, binaries).

In our current context, people understand and produce themselves in relation to others through the production and expression of discrete data. This is evidenced in the ubiquity of dating apps, and social media, in access of cultural artefacts, and how we choose to quantify, survey and record our bodies, movements and connections. We take these categories provided to us by language and culture, and repeat them ad nauseum. Data about who we understand ourselves to be is amplified and made rigid through this constant iteration.

Computational identity, produced through the repetition of binaries, no matter how complex, can only ever be a way to describe a galaxy of ringed fences. It is an algorithmic logic of identity.

Rather than addressing this iterative straitjacketing through an obvious, and obviously regressive impossible return to the analog, I ask whether we can use elements of quantum mechanics to model the possibilities of gender and sexuality that retain the unexpected, to allow for the "dark matter" of ourselves. Using Karen Barad's 2019 essay on Quantum Field theory (QFT) as a point of departure, I will argue that the implications of conceptual quantum computing (including the capacity for both positions in a binary to be expressed simultaneously) offers an escape.

PS-3B: Informatics of Domination and Beyond: Material-Informational Power and Its Effects (3B)

Time: Wednesday, 24/Mar/2021: 12:00pm - 1:30pm
Session Chair: Pinar Tuzcu

A Case of De-colonialist AttnGAN Text to ImageSynthesis

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At a time when AI-related technological infrastructure is becoming increasingly common in many aspects of life, this project attempts to demonstrate how bias in AI programming can affect an AI model's interpretation of a dataset and how it can subsequently impact under-represented subjects. It pivots on an AttnGAN Text to Image synthesis pipeline as the means to pragmatically explore, articulate, and address affairs of bias in historical and digital colonialism. It zooms in on Cyprus, a geographic region that is underrepresented in AI programming, as seen through the lenses of 19th century colonialism, and intends to be the outset of a conceptualisation process about post-colonial Cyprus and how it may represent itself on own terms, and in relation to ongoing discourses on digital colonialism.

As such, it fosters a critical perspective on AI related research and, at the same time, it aspires to give agency to an underrepresented with AI milieux socio-cultural locus, resulting in a series of documents that document this process.

Cybercolonialism and New Materialist Perspectives on The Politics of Prediction in the Age of Big Data

Pinar Tuzcu

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"The key roles" that the digital media giants such as Facebook and Google played in the "2016 United States presidential election," as Safiya Noble points out in her book Algorithms of Oppression, epitomise the impact of technical bias on the social and political climate. Indeed, in 2018, the British company Cambridge Analytica was accused of gathering personal data from millions of Facebook accounts without user consent. Thanks to a software programme (i.e. app) called 'This Is Your Digital Life', the firm harvested personal data – from millions of Facebook users and their personal contacts – through the giant social media platform. The whistle-blowers, who were former high-ranking Cambridge Analytica employees, revealed that the data from Facebook users were collected to influence voters' behaviours in elections around the world. Eventually, investigations uncovered that Cambridge Analytica's services were used in 'democratic' elections in 68 countries – most notably the Brexit referendum in the United Kingdom and the United States presidential election, both in 2016. Nonetheless, the most striking revelation of the Cambridge Analytica scandal was that the overwhelming share of intervened elections occurred in the Global South. In this paper, I focus solely on the 2010 general election campaign in the dual-island country of Trinidad and Tobago, located in the south-east of the Caribbean Sea.

In this talk, by analysing some of the leaked materials from a new materialist perspective, I discuss how digitized data interpretation methods such as predictive analytics were used by the company in order to rhetorically legitimise the election strategies that aim to suppress and manipulate the voters in the Global South. I suggest that the company's involvement in these elections in the Global South delineates cybercolonialism, new kinds of colonial connections and interactions emerge from this asymmetrical technodiscursive power.

Coded Feminisms in Indonesia

Stefanie Wuschitz

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With this paper I want to examine feminist maker collectives' capacity to generate post-capitalist subjectivities. Feminist maker collectives in Indonesia aim to maintain an independent culture scene to urban as well as rural citizens. Yet, they are actually quite hard to find in physical space. The collectives examined in this paper host remarkably large, professional and sophisticated online platforms to support their strategically less visible on-site activities. In an ubiquitously digitalized Indonesia, these initiatives' web presence curiously primarily addresses an international community. In applying digital tools they can, to a certain extent, avoid police persecution, piggy back onto still tolerated big tech systems or build their own invisible networks. Looking at the tactics of the "grandmothers" of this vibrant feminist art and maker scene - the antiimperialist and feminist movements before the New Order regime - might inform our understanding of feminist, environmental and social justice initiatives in present day Indonesia.

Techno-feminism in a southern city: The case of /etc Athens through a feminist new materialist lens

Natalia Avlona

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During the last three decades, programmers, hactivists, academics and lawyers contributed to a burgeoning literature and practice around the digital commons, as these information and knowledge resources that are collectively created and owned among a community. These communities that were created around the Free and Open Source Software Movements (FOSS), the Free Culture, and the Access to Knowledge movements (A2K) were consisting democratic anti-paradigms against the techno-deterministic narrative of the Fourth Industrial Revolution. The "hacking culture" which characterised these communities, despite of bearing post-capitalist promises and evangelising the values of horizontality, and sharing and learning by doing, has been dominated by a Eurocentric, white, tech-savvy masculine paradigm. However, this underrepresentation of women, queers, people of colour, and technologically illiterate people, has been addressed by the peripheral emergence of feminist hackerspaces, and techno-feminist groups and festivals devoted to a gendered hacking of the FOSS values.

In this presentation, the oldest nomadic, techno-feminist network and festival /ETC, which since the last nineteen years takes places annually in a different European city and is organised and performed by women and members of the LGBTQI community, will be examined through a feminist new-materialist methodology. The online and offline nature of the network/festival and the diverse educational, artistic and performative practices that /ETC has been developing, exclusively utilising the Free and Open Source Software and Hardware, provides us with a rhizomatic strategy of techno-feminist

organisation, that allows alternative collective and nomadic subjectivities to emerge within the hacking culture. The co-organisation of /ETC Athens in 2019 by the researcher will serve this presentation with the double agency of the researcher/organiser who combines auto-ethnography and participant observation methods. Lastly, the situatedness of a southern city like Athens generates a techno-feminist standpoint which will tackle the issues of precariousness and labour in the reproduction of infrastructure.

PS-3C: Informatics of Domination and Beyond: Material-Informational Power and Its Effects (3C)

Affective Gaming, a New Medium to Emotional Simulation in the Posthuman Convergence

WK Vickie Monthong
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Video Gaming provides a cyber space, generating situated experiences that connect individuals in the Posthuman age. Simulations created in games each have different economic, social and political features. This manifests a rhizomic ontological structure, bridging players and marginalized characters in the virtual reality. Video games grant players a comprehensive sensory experience, which allows them to dive into the situated experience of another being. This paper discusses the potential force of video games in the non-human convergence through Affective Theory and Logic of Sense.

The comprehensive sensory experience introduces players to a whole new surrounding in affective gameplay. Virtual reality provides more emotional involvement through the closer affective experience. As such, video games are a new medium for storytelling. The player is forced to respond to the game in order for the storyline to go on. With the intense interaction between the game and the player, at last, the player turns into the game by becoming the game. Players experience a different life and gain insight from another situatedness in narrative-driven games, voicing out the world of the marginalized.

Through simulations in video games, gaps between embodied and embedded entities, especially among different racial, sexual and social backgrounds, are bridging in. Gaming creates diversity and asks players to inhabit the characters' emotional world, depicting the living experience of the marginalized. Video games are a hybrid of science and art, the convergence of rational and emotional. From lines of coding to a gameplay that involves narrative, the building of a particular atmosphere and even a whole worldview. It moves forward to the usage of nonhuman-virtual reality force to voice out the other nonhuman categories in their situated experiences by simulating the economic, social and political causes in the reality.

Inhabit the screen. Social Distancing in the Hyperconnected Era

Selenia Anastasi
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This paper explores the digital technologies has been adapted to find solutions for living and working during the coronavirus pandemic. Particular attention is paid to the dynamics of aggregation, meeting and entertainment born in response to social distancing. From a methodological point of view, significant trends have emerged by mapping SNS through scraping and visualization techniques while other conclusions were reached with an approach tending to trace the users' habits by methods closer to those of ethnographic research. As Rogers suggests (Rogers, 2013), studying the relationships between people in a virtual environment require the development of many other qualitative strategies, such as the comparison between the features of the emerging softwares, asking why people chose them. Thus, the data collected confirmed what Floridi already claimed about the Onlife: «the blurring of the distinction between reality and virtuality [and] the shift from the primacy of entities to the primacy of interactions» (Floridi, 2015).

In this framework, the shift from the paradigm of the Internet as an external space to that of the Internet as an internal space is confirmed by the massive use of video as a privileged medium during the lockdown phase, configuring the rectangular space of the interface as a "technology of digital living" that can be furnished and customized as desired. Following the path traced by Ferrando, «physicality no longer represents the primary space of social interaction: the decentralization of the self into virtual bodies and digital identities has transformed the Baudrillardian simulacrum into finalizing hyper-realities» (Ferrando 2013). The imminent prospect of low-cost augmented reality visors will put the ontology of relationships and spaces even more under discussion. Analysis of material cultures could help us to discover what new social meanings are conveyed by the artefacts of everyday use in an Hyper-connected Era.

Possibilities for virtual feminist pedagogies of care in pandemic times

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The global covid-19 pandemic is generating unprecedented challenges in the educational field. During the lockdown in Spain, the digital environment acquired a relevant role in the pedagogical sphere. Nonetheless, the different school contexts required specific actions for attending their students' needs.

This communication explores how the digital has modified the pedagogical praxis, opening debates about the entanglement between digital-affective-cultural-political-material-pedagogical worlds. We depart from two case studies in Catalonia (Spain): a) a countryside secondary school with a high socio-cultural and economical capital student population. b) a secondary school placed in a historically segregated area of Barcelona, with a high percentage of social exclusion risk students.

In intra-acting a Feminist New Materialist (Colman, 2014) approach with digital ethnography (Pink et Al, 2016), we seek to understand how pedagogy has been materialized through "relationalities, temporalities, and intensities which traverse both school and online socio-spatialities" (Bustillos, 2017, p. 174) as well as how the virtual in the pedagogical praxis has comprised an "embodiment of matter and information [...] situating political realities" (Revelles-Benavente, 2014, p. 41).

From this perspective, the use of the virtual has been affected by social contexts, showing that the digital divide is a social divide. As Feminist New Materialism is focused on "possibilities instead of results" (Revelles-Benavente and Cielemcka, 2016), our purpose is to construct a respond-able pedagogy in times of crisis (Revelles-Benavente and González-Ramos, 2017).

Our proposal is that a "slow education" (Domènech, 2014) materialized in the virtual can attend diversity through solidarity and practices of care in virtual space-times. This can break the neoliberal logic of educational systems, emphasizing the interdependence and vulnerability of human beings (Conesa, 2017) through "Ethics of Care" (Tronto & Fisher, 1990). With this proposal, we do not seek to find generalizable results but placing the research in local realities in order to connect with global issues (Revelles-Benavente & González-Ramos, 2019).

Objectivity claims, subjectivities and the aim of a gender just AI

Corinna Bath

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Artificial intelligence, particularly when using machine learning approaches, is mostly build on data from or about users. There is hardly any other technoscientific endeavor we can think of, which is so intimately and inextricable entangled with the social. Nevertheless, some proponents of the field claim the objectivity of AI's results – be it an algorithm that is expected to detect cancer from photos better than medical experts or a recruiting software that is assumed to make more precise predictions of workers' future performance than any human recruiter, whose decisions are presumed as rather subjective. Such expectations, however, were meanwhile debunked by numerous case studies, which point to the biases and discrimination in AI systems and algorithms. Feminist STS researchers analyzed that the use of AI algorithms with data from the past can reproduce existing social inequalities of these times instead of creating livable worlds. Moreover, probabilistic methods tend to reinforce social norms and stereotypes. Also, new conferences in computer science (e.g. the FAccT conferences) indicate that we cannot reduce the problem of bias to the data used for the training of algorithms, but also need to take into account the methods, the algorithms themselves and much more.

The objective of my contribution is twofold. I will draw on new materialist thinking, particularly Lucy Suchman's account of human-machine (re)configurations, in order to analyze these phenomena as entanglements of humans, data, methods, algorithms, discourses, histories, imaginaries, social structures etc. By discussing the knowledge politics of two empirical fields, health apps for diagnosis and conversational robots, which - as parts of the realms of medicine or language recognition/generation - relate to different socio-material imaginaries of objectivity and subjectivities, I will also ask how to re-configure these apparatuses towards a more gender just AI.

D-3: Demonstrations (3)

Demonstration session is dedicated to presentations and discussions with the authors. Demonstrated works will be accessible online throughout the conference.

Hacking Concrete

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http://meltionary.com/hackingconcrete/start.html

For New Materialist Informatics we propose to make a meltry on "hacking concrete" that sits at the intersection of crip technoscience and material instability. In the crip technoscience manifesto, access is defined as both related to attack and contact. Instead of the "integration" of disabled body-minds into normative space, Hamraie and Fritsch (2019) point to the various ways in which disabled makers hack or make otherwise trans*feminist presents. We are picking up the technofeminist practice of hacking by intervening in technosolutionism (Morozov 2013), by resisting the consolidation of worldmakings (Muñoz 1999, 195) that don't suit us.

When making concrete, a powder is mixed with water and poured into structures in which it hardens into curbs, sidewalks, stairs, walls, streets and foundations. We will work with the moment of formlessness before the hardening to discover access potentials within something that ontologically, metaphorically and physically is not yet stable. By keeping concrete "open" by adding more water, and churning/stirring, we will uphold the moments of reformation and keep different pathways available that resist hardening on a material level. "Hacking concrete" will be shared as images, .gifs, videos and language experiments on our website. Crip technoscience works with frictional ways of making access in socio-technical worlds. By studying friction as heat, we are researching how to pursue softness towards forming differently and making access practices that continuously churn. This speculative design project throws a hot critique towards ableist structures and melts assumptions of stability.

Stones that calculate

Paul Heinicker[1], Jonas Parnow[2]

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https://stones.computer

Information technologies consist of minerals, of metals, and other natural materials. Their origin is thus the stone and they are therefore fundamentally geological. We process stones and put them under electricity to comprehend the world and rock-hard realities around us. Stones that calculate are at the center of the problem-solving strategies of the complex issues of the present.

By stones that calculate, we mean the assemblage of all information processing devices or infrastructures and their socio-political impact on our automated society. From smartphones, Internet cables to data centers, we look at the material complexity, cycles and dependencies it takes to provide the enormous data and energy resources needed for our daily Netflix consumption, climate models and algorithmic governance.

We propose the category of stoniness to make the connections between ecology, power and information technology visible. In order to structure the extended notion of stones, we developed an appealing online collection of resources that maps academic as well as artistic perspectives which reflect digital conditions within materialist discourses. Under the label of post-digital materiality, we combine historical classifications, critical analyses and speculative interventions from both established voices as well as young researchers.

In detail, we have examined the research field on the basis of three topics from which we derived sixteen perspectives. The topics will therefore propose three material dimensions, we ought to be relevant but are aware do not cover all perspectives. We begin with the actual material conditions of digital infrastructures asking what is a stone? We then scale up to power and geopolitical questions of the digital asking where is the stone? In the last step, we ask for moments of corporeality in the seemingly dematerialized digital space under the theme of who holds the stone?

PS-3D: Contagious Life and Education's Erratic Encounters with Informatics (3D)

Contagious life and education's erratic encounters with informatics

Webb Taylor[1], Marcelina Piotrowski[2], Petra Mikulan[1]

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This panel works with the idea of contagion to examine transmogrifying aspects of informatics and data in education, particularly the ways in which digital contagions in biopolitics, neurology, and ecology take on a life of their own and multiply life. We focus on how data resists representations of matter, and how it morphs, drawing on Luciana Parisi's (2007, 2013) concept of contagion. In her work on artificial intelligence, Parisi argued that 'life' is produced through "contagious transmission rather than filiative heredity" (Parisi, 2007, p. 32). We work with contagion as an important way to counteractualize ideas about representation, liveliness, and subjectification of 'data,' often taken up through vitalist discourse. Our three papers examine the vital, artificial, ecological aspects of data/life, a conjunction that Hayles (1999) referred to as informatics, and one which we argue operates in erratic, contagious ways, challenging modernist and utilitarian ideas of informatics.

The first paper discusses contagion as a form of errant and necrotic life that interrupts teleological enunciations of life as 'active.' It argues that the pluralist codifications embedded in epistemologies, axiologies, and ontologies are no longer about human notions of production and reproduction, but contingent practices of decidedly non-human and contagious silicon-based objects. The second paper argues that conditions of planetary life are increasingly sensed through wearable informatics at the level of the biological (i.e. wearable sensors). It shows how sensors, positioned to equip humans with verifiable forms of data, morph the very idea of a 'thinking subject,' infecting sites of thinking, while proliferating the 'unknown.' The final paper proposes a speculative reading of life as excess contagion. It forwards the risky suggestion that educational theory concerned with the decoloniality of informatics needs to contest with vitalist and racist declarations found in harmonious modes of becoming of human and inhuman networks of relationality.

PS-4D: Tackling the Carbon Footprint of Streaming Media (TCFSM): A Transdisciplinary Laboratory for New Media Informatics (4D)

Time: Wednesday, 24/Mar/2021: 7:00pm - 8:30pm
Session Chair: Laura U. Marks

Tackling the Carbon Footprint of Streaming Media (TCFSM): A Transdisciplinary Laboratory for New Media Informatics

Laura U. Marks, Stephen Makonin, Radek Przedpełski, Alejandro Rodriguez-Silva
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The panel aims to share findings of the TCFSM research project led by media scholar Laura U. Marks and IT engineer Stephen Makonin, professors Vancouver's Simon Fraser University, joined by researchers: engineer Alejandro Rodriguez-Silva and media scholar Radek Przedpełski. Funded by the Canadian SSHRC Knowledge Synthesis Grant: Living within the Earth's Carrying Capacity, the project aims to translate engineering and media industry literature for lay audiences, accurately measure the carbon footprint of the ICT sector, raise awareness, influence policy, and propose solutions. Streaming media is calculated to account for over 1% of global greenhouse gases emissions, or as much as 1/3 of the ICT sector, and rising exponentially. Digital media is not virtual: it has a real, material impact on the Earth. Our transdisciplinary project inscribes itself in new materialist informatics by interrogating the material conditions and environmental effect of streaming online media across data centres, networks and end-user devices. We bring the disciplinary tools of engineering and media studies to analyse TCFSM and critique the ICT industry's 'outsourcing' of this problem to the future, the planet, and engineers themselves. TCFSM effectuates a crosspollination of perspectives: engineering becomes exposed to a critical analysis of the underlying politics of ICT research, while media philosophy becomes more robustly materialist. Furthermore, as part of the project Marks founded the annual Small File Media Festival (08/2020), for media artworks under 5 MB in size and under 5 minutes in length, as an attractive way to draw attention to the problem. TCFSM continues the Deleuzoguattarian interdisciplinary engagement with the 'three daughters' of chaos¬—science, philosophy and art¬—as 'forms of thought or creation'. Our new materialist informatics understand streaming media as 'operational images' in the sense of Harun Farocki, i.e. images that 'do not represent an object, but rather are part of an operation.'

PS-4A: New Materialist Design and Praxis (4A)

A new materialist approach to interactive documentary design: The case of the Kaira Kunda eco-community

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This paper explores the impact adopting a new materialist theoretical perspective can have on the design process of informatics systems. It does this through examining the case of my in-development interactive documentary on the Gambian migrant eco-community Kaira Kunda in Valle de Lecrín, Spain. The paper conceives of interactive documentary as a socio-technical computational assemblage of human and non-human elements. It explores how adopting a new materialist approach influenced design choices for the interactive architecture of the documentary and how this approach also helped to define its role within the community as an informatics system supporting the community's activities. The paper contrasts this approach with conventional perspectives on interactive documentary that use story and representation as their framework. It draws its inspiration from documentary theorist Adrian Miles's invitation "to take seriously the practical and theoretical implications of new materialism and actor-network theory … for interactive documentary" (2018, 305) and builds upon my own theoretical (e.g. Hondros 2020, 2018) and practical (Hondros 2014) work in this area.

The paper uses new materialist theories that emphasise relationality to think about the computational entanglements within socio-technical systems. These theories include DeLanda's (2006), Buchanan's (2020) and Stengers's (2012) different insights into Deleuze and Guattari's notion of assemblage; Actor-Network Theory; and Barad's (2007) concept of intra-action. After outlining these the paper goes on to show how the different theoretical concepts and sensibilities they involve influenced design choices concerning the system's architecture, the type of content required to populate it, and the type of relationships these content elements had with each other and the overall system (as defined through hyperlinks, tags, filters and algorithms). The paper also examines how this approach helped define the roles of humans within this nascent computational assemblage and evaluates the Deleuzian notion of desire in the context of its design.

Interfacing, Surfacing, Stacking. Towards an Analytics of Material-Informatic Practice(s)

Benjamin Lipp, Henning Mayer
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Human-computer interaction (HCI) has become a pivotal topic in the social sciences. Here, scholars have studied HCI in terms of its technical components, e.g. user interfaces (Hepp 2020, Cirucci 2017), software code (Berry 2011, Mackenzie 2017, Marino 2020) or infrastructures (Kitchin 2014, Mackenzie 2016). Building on New Materialist thought (Barad 2007, Suchman 2007), we aim to consolidate and expand this scholarship within an analytics investigating the material-informatic practices that underlie HCI.

We focus on three such practices: interfacing, surfacing, stacking. (1) stacking describes the process by which data sets are rendered inter-operable (Straube 2016) to form machinic cues, i.e. behaviour at the front-end, e.g. blinking or error logs. (2) surfacing then relates to the process by which such machinic cues and cues by (human) users are rendered mutually intelligible (Mayer 2020). Here, developers configure surfaces shielding their systems from the user while at the same time eliciting 'depth' in order to organise the user's attention. An example for a 'deep' surface would be the display and/or recognition of emotion or intent. (3) interfacing refers to the process by which both humans and non-humans are rendered available as mutually intransparent surfaces in order to form interfaces, i.e. reliable patterns of communication (Lipp 2019). This involves the continuous adjustment of such surfaces vis-à-vis one another, e.g. by calibrating audio sensors, the user's voice, and unwanted noise in the environment.

We will illustrate this theoretical framework with our empirical research on social robotics and intelligent assistants. In doing so, we will show how these different types of material-informatic practices operate in order to engender phenomena of HCI. We finally give an outlook on how such an analysis of material-informatic practices can carve out issues of power and bias in HCI.

Material entanglements of categories: Analyzing the classification praxis of queer archives using the concept of boundary objects

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In this paper, we present a field study that examines the development, application and maintenance of classification systems and controlled vocabularies in three archives documenting lesbian, trans* and queer-feminist histories. The results of our study are not only relevant for archival objects and documents. They provide significant insights for the ongoing discussions within critical data studies about the epistemic status of categorizations. The concept of boundary objects functions as a central theoretical foundation of our research. We show that Bowker and Star's analysis of classification systems provides helpful points of reference for tracing the material basis of classification processes.

Queer archives face the challenge of documenting identities that are inherently characterized by fluidity and ambiguity. Thus, queer identities are diametrically opposed to archival procedures of stable and unambiguous classification. At the same time, queer activism relies partly on coherent identity categories in order to be able to act politically. Spivak describes this as strategic essentialism. We examine the pragmatic solutions that queer archives establish when dealing with tensions between those seemingly contradicting requirements. For this, we have conducted semi-structured expert interviews with staff members of three queer archives. The classification practices of these archives serve as a starting point to explore the sustainability of data conventions over time. Although there are initiatives developing metadata standards for queer identities, these standards are only used to a limited extent by the queer archives we examined. Rather, they devised their own idiosyncratic classification strategies that are rooted in their specific history.

This study confirms that classifications are largely shaped by the organizational framework and the perspectives of the people that create them. Our findings illustrate how classifications are unique artefacts that are imbricated not only with particular political commitments, but also specific forms of discourse and activism that were relevant during their creation.

PS-4B: New Materialist Design and Praxis (4B)

Time: Thursday, 25/Mar/2021: 11:30am - 1:00pm
Session Chair: Nancy Mauro-Flude

The Substrate of Hardware: Transdisciplinary Computing Aesthetics from the Global South.

Nancy Mauro-Flude
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This presentation addresses the cultural chasm – which has been widening since the Industrial Revolution – between the production and consumption of technology. It contributes to role played by computational machines in contemporary culture, specifically, through performance art. It examines the depth of the reach of the computer into the social fabric of everyday life through a series of performances which reveal the tacit capacity to know the elemental procedures by which informatic patterning functions, without having to break them down into a set of instrumental commands (Parisi 2019). The habit of instrumentalising technologies that began a tactic to disassociate mathematics and mechanical arts in from occult association (Neil 1999), leading to the supremacy of incorporeal logics. Beyond technological pragmatism, this inquiry embraces dark calculus, mesmeric algorithms, geometric-logic filtering of informatic paraphernalia which has indeterminate and infinite capacities. This research builds on the experimental ethnography proposed by Fisher (2018), who asserts these new social structures and emergent new forms of life are 'both biological and social' and often quite intertwined. To underscore the relations between living entities and telluric currents, contemporary concerns about the tenuous ecologies of the lived world, the magnitude of the mined material elements of which a computational media composed of, and the affordances of this polyvalent assemblage are addressed. Wading through the debris of concealed knowledges, an archaeology of promiscuous grime and leaky simulations and of geological minerals of which hardware is composed. In the unravelling of what is visceral, biological and what is engineered we are enabled to countenance a software cornucopia of flora and fauna where geometric mirroring exposes a compelling entry point to an oeuvre in which objective concepts of industrial machinic recurrence and progression merge with viscerally aesthetic traditions and are embraced as exuberant forces rather than as conflicting ones.

Artificially Shared Intensities

Lisa Müller-Trede
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Sharing intensities between organisms implicates kinaesthetic awareness. One 'measure' of kinaesthetic processes which, in a Deleuzian reading, remains different in itself or affective (2001, 232), might be the audible breath. As muscles are fed with oxygen in order to move, the breath provides information about how it advances. Kinaesthetic perception relies on physical changes in position and these adjustments are in correlation with the breathing of the organism. I want to suggest here that the breath—when converted into electrical energy via a microphone, amplified, and made available to another body in the form of sound—may function as a nexus for emergent coordination between bodies. Through sharing the breath's sonic tensions and fluctuations, these bodies may kinaesthetically attune in a joint effort to recognize the "continuities and discontinuities, the rising and falling of order and information" (Grosz 2017, 217) which connects organisms and their milieus. When performing tasks together, bodies which are kinaesthetically linked through the breath in this manner need to focus less on the prediction or simulation of each other's actions and seem to instead shape their movement together (Manning 2012, 31). This collective individuation cannot be divided along strict binaries of activity and passivity (Simondon 2020, 278) and the transduced audible breath provides the opportunity to examine the bodies' agentic force as much through the 'silent', sustained moments between the in-breath and the out-breath as through its reverberation.

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Radio Explorations: Computing Identities of Transmissions

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The SNSF-funded Radio Explorations project engages with a digital archive of radio signals (SIGID Wiki) collected by radio enthusiasts. Radio Explorations operate within the continuum of societal and technological concerns, addressing the onto-epistemologies of radio signals: the process of their categorization and identification. Radio was 'heard' before it was 'invented', Douglas Kahn recounted the strange experiences of Bell's assistant Thomas Watson listening to natural radio. Radio transmissions are hard to characterize because most signals do not have a static representation: especially when transmitting data, signals have different modes, phases, and other temporal variations. Starting from an unordered collection of recordings of different transmissions and their meta-data (frequency, bandwidth, mode, location), the aim of this project is to articulate signals' identities in terms of their own characteristics (rather than pre-existing ontologies). To this end, I examine the capacity of machine learning techniques to support identification of environmental radio transmissions. With artificial neural networks (ANN) of the self-organising map (SOM), I articulate a 'data observatory' that orders data on radio signals based on computable similarity. The 'data observatory' is a digital tool, a navigation apparatus which can be used to orient oneself in the vast landscape of data on radio transmissions. I do not propose to understand these identification processes as world making but, on the contrary, as arbitrary renderings of reality in the eyes of a machine, affirming inherent instability and flexibility of a signal's identity. By rendering signals commensurable in this way, I propose to take an active stance with regards to machine learning algorithms and expose a research interest from which we can learn and tell stories about signals.

Sonifying Networks: A Material Approach to Technological Communications

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Today, public concern with the extent to which networks influence people's routines, and how much they affect cultures and societies, has grown substantially. The stories that media circulate typically rely on the "magical" nature of networks and therefore accentuate their figurative power. But, for people to participate meaningfully in the conversation, they need access to the complexities and technical intricacies of networks, not just their surfaces or metaphors. This paper argues that, by listening to networks, people can begin to apprehend, and even comprehend, the complex, ostensibly "magical" nature of technological communications. Networks are very noisy, and they do not, for instance, use alphabetic language for internal or external communication. They do however use Electromagnetic waves as a physical material for their communications. Of course, network communications must first be rendered audible for people to hear them. For this purpose, I propose "tactical network sonification" (TNS), as a methodology that begins with transducing electromagnetic (EM) waves essential to technological communications, using Shintaro Miyazaki and Martin Howse's Detektor. Further, I adopt Michel Chion's techniques of reduced and causal listening as two ways that afford a "sensible" and timely method for approaching network sonification. In doing so, TNS brings forth the materiality of technological communications in the form of sound, making it possible for people to hear the overlapping rhythms and layers of sound that each clip contains. Specifically, this project engages sonification as new materialist framework for approaching networks. It focuses on making the materiality of networks sensibly accessible to the public, especially people who are not technology experts. Finally, TNS provides a language for people to talk about the materiality of networks beyond theoretical and metaphorical arguments, to communicate their physical and sensible experiences of networks in an informed way.

**Sonification examples available at https://soundcloud.com/tracey-el-hajj/sets/localstudy.

PS-4C: New Materialist Design and Praxis (4C)

Seeking difference in relation: diffracting human-robot relationships

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'Social robots' are deliberately positioned on the boundary between subject and object. Dominant social robotics practices seek to model machines as humanlike as possible, which as Suchman argues, threatens to breakdown the subject-object boundary "at the same time that it reiterates its founding identities and differences" (2011). Humans and machines here are universalist, binary categories, as if they were naturally given or historically and culturally neutral (see Nakamura & Haraway 2003, Barad 2007).

This paper adopts Haraway's (1992) and Barad's (2007) theoretical lenses of reflection and diffraction to probe into the making of human-robot relationships. Reflection, according to Haraway, "only displaces the same elsewhere, setting up worries about copy and original" (1992). Stereotypical robot designs not only reflect but also reaffirm gender roles and divisions of labour (see Søraa 2017, Stacey & Suchman 2012). Diffraction, in contrast, "attends to the relational nature of difference" (Barad 2007) and shifts the focus from representationalism to performativity. A diffractive approach to human-robot relationships recognises the entangledness of human and nonhuman and seeks new forms of sociality arising from difference in relation, rather than mechanical distortions of the human.

My theoretical discussion will draw on my arts-led, collaborative Machine Movement Lab (MML) project, which opens up intimate links to performance-based inquiries into the enactment of human-robot relations and the situatedness of both human and nonhuman participants. Foregrounding their unique differences, MML locates itself in the middle of the encounter, where human-machine boundaries are relationally enacted. The relational-performative approach to robot design harnesses dancers' "tactile-kinesthetic bodies" (Sheets-Johnstone 2011) to open up the unique material and perceptual world of a machinelike, cube-shaped robot. To facilitate social encounters, our Performative Body Mapping methodology situates the robot's learning in our "social and cultural scaffolds" (Lindblom 2020) to evoke "intra-bodily resonances" (Fuchs 2016) between human and machinic participants.

Designing configurations that matter. (Re-)imagining HCI through dis/ability

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Interface constellations, as material-discursive configurations that organise (and are organised by) the relation between humans and computational technologies, often can't accommodate bodily diversity. Disability is a complex, dynamic and evolving category, comprising a wide range of discourses, practices, material relations, affects, and lived experiences. (Re-)imagining HCI through dis/ability means diversifying design research and theory and accounting for its universalising/naturalising effects, which are compulsory working to streamline the complexity, messiness and ambiguity that makes up our* lives with others*, artefacts and (im)material space. Turning to Disability Studies and research on the body and embodiment can open up design discourses and practices to controversy and critical investigation, and aims to deconstruct self-perpetuating common sense claims of the good/natural order of things.

Disability, as an embodied and analytical encounter, comprises various concepts and lived experiences of skilfully and artfully negotiating and remaking environments that are inaccessible or even hostile. This paper argues that current concepts and strategies for accessibility/inclusivity are generally based on expanding the realm of the normal and ordinary and force assimilation into normative able-bodied worlds. Disability is explicitly or implicitly treated as a constraining add-on or afterthought to the 'normal' design process, which (unwittingly) attempts to bridge, fix, or eliminate disability instead of centering it for its generative potential and ingenious creativity. The careful unpicking of ability and disability will expose the privileging of certain bodies over others by designing interfaces for the cognitive, physical and sensory abilities of an elusive average or typical user* (and her imagined modal, mainly audiovisual, preferences and desires). How are difference and its marginalising/discriminating effects coded into (im)material environments? How can disability studies' critiques of everyday socio-technical practices be used to disentangle taken for granted imaginaries and processes in HCI? How can notions of the 'normal' user be unsettled?

Connected toys for grandparents and grandchildren

Marije Nouwen[1], Janne Mascha Beuthel[2], Verena Fuchsberger[2], Bieke Zaman[1]
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Grandchildren and grandparents that are physically separated build their relationship in interdependence with a set of technologies, objects, imaginations and places. Activities like talking, watching or showing are rather straightforward when using video applications. However, such actions rarely end in play activities over distance. We build on the work of Hillevi Lenz Taguchi (Lenz Taguchi, 2014), Jackie Marsh (Marsh, 2017) and Pauliina Rautio (Rautio, 2014) on child play across physical and digital domains to consider how children might play with their grandparents in a different location. We present the outcomes of a probe study (Gaver et al., 1999) on remote play and communication with grandparents (60-70 years old) and grandchildren (6-10 years old) in Europe. Our goal is to speculate on design affordances for (connected) toys and play.

References

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Affective Glitches in Human-Social Robot Interaction

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The paper aims to advance theoretically the debate on the dialectical features of humanoid robots – being both instrumental objects and communicative subjects. Previous research has demonstrated that the successful interactions between humans and robots are based on the anthropomorphization of robots, particularly on the human-like appearance and behavior. However, there is far greater subtlety to be a humanoid robot than being a mere human replica. In this paper, from a new materialistic perspective, I focus on how technological properties such as robots' metal bodies, synthesised responses, and occasional glitches participate in producing human-robot interaction. By examining the publicly accessible records of sensory, bodily experience – in both textual and audio-visual forms – of the encounters between humans and speculative humanoid robotics designs created by Ishiguro Laboratories in Japan, I investigate how humanoid robots are imagined, conceived, and designed as communicative subjects as well as how humans perceive their connections with robots. Based on analysing the encounters through affect theory, I argue that the glitches play a fundamental role in turning social robots into affective sites in connecting with humans. While the glitches remind the absolute gap between humans and robots, it is the gap that enables the intensities to pass through the flash bodies and the metal counterparts and realizes robots as not only subjects but intimate ones. A humanoid robot is neither a human substitute nor a machine; rather, they are mechanically-assembled human-like subjects who established intimacy with humans. The ways that humans can perceive the physical, cognitive, and emotional closeness of humanoid robots situate in the subtle difference between humans and robots, which are assured by the glitches, the technological properties.

PS-5A: Ethics, Aesthetics and Futures of New Materialist Informatics (5A)

Time: Thursday, 25/Mar/2021: 2:00pm - 3:30pm
Session Chair: Waltraud Ernst

The Virtual Imaginary as Social Reproduction. Thoughts on and with Care and Work in Digital Cultures

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Technological "solutionism"(Morozov 2013) presents technologies as a neutral, efficient and increasingly as the only or most superior answer to increasingly complex social questions. Very often, it is based on a virtual imaginary, which presents technologies as disembodied and thus decoupled from the human work contained in them (imagined as flawed or inferior). It is noticeable that the virtual imaginary often appears to be most effective in those places where already structurally precarious bodies (women*, migrants, informally working people) are further made invisible in their work. They become "surrogates" (Atanasoski and Vora 2019), sustaining societal reproduction, without actively being seen in their reproductive role. Virtuality signals potential (Massumi 2002), but also the veiling of material realities of those involved in its production. How does thinking about virtuality allow for the visualization of human labor in supposedly autonomous digital processes? The planned contribution seeks to understand the production of a virtual imaginary as a form of work that is significantly involved in processes of social reproduction. In Jasanoff's sense, this imaginary produces itself as an "organized field of social practices (both in the sense of labor and of culturally organized activities) and a form of negotiation between places of action ('individuals') and a globally defined field of possibility" (Jasanoff and Kim 2015) How can seemingly virtual/non-human action processes be made visible in terms of their material and embodied effects and conditions? What kind of concept of social reproduction - as work on the virtual imaginary - can emerge from it and what are its emancipatory potentials?

Careformatics — Encountering the Banality of Technology Research

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Responsibility, fairness, accountability, and transparency are prominent concepts within informatics and technology research to provide for structured and clearly delineated ways of ensuring the creation of equitable research and design. However, those are fundamentally centred on technologies, developers and research instead of centring the needs and desires of diverse populations and can even exacerbate marginalising effects (Hoffman, 2019). To effectively account for and wrestle with the material consequences of our individual and collective research and design endeavours, we require a more situated, continuous and ongoing approach not aimed at finding 'solutions' to these ethically charged issues but rather staying with the trouble (Haraway, 2016). In developing my concept of Careformatics, I use theories from Disability Studies (a.o., Clare, 2017; Hamraie, 2017; Hamraie & Fritsch, 2019) and loving epistemologies (a.o., Jaggar, 1989; de la Bellacasa 2012; de Jaegher, 2019) to critically review previous projects with my involvement and identify differences in thinking through them along responsibility, fairness, accountability, and transparency vs care, reflexivity, attention, and love. I show how these elements of Careformatics as a concept derived from marginalised perspectives might allow us to acknowledge plurality, divergence, difference and on-goingness. Instead of us alienating ourselves from the material consequences our work entails, I suggest, we start consciously wrestling with the banality of technology (in analogy to Arendt, 1963) and take up the obligation to involve ourselves more with the world in which we research and remain answerable beyond formalised structures.

Prognosis, diagnosis, and care for the living body?

Waltraud Ernst

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So called „artificial intelligence" is implemented in medical engineering in many areas, e.g. diagnosis for breast cancer, prognosis for dementia or defining risk of heart disease. „Artificial intelligence" is based on machine learning, management of big data and automation of test methods. This means the analysis of those data of human bodily existence is also mechanised and automatized, methodological relying on data acquisition, pattern recognition, probability calculation. This evokes questions as: Which data are available? Which data appear relevant or important? Who is defining the patterns and mechanisms of machine operation and analysis – and along which criteria? Which criteria are the basis for sorting, evaluation, categorization?

In the paper these questions are discussed and investigated how gender and the plurality and particularity of bodily existence becomes relevant in these processes. Are data from all genders taken to be important in the same way? Are the machines taught about the abundant diversity and plurality of gendered bodies? Is there room for taking ambivalence and change of the natural/cultural materiality of living gendered bodies into account? How are the intra-actions among the materiality of machinal and bodily existence conceptualized? Is there conceptual space for constant becoming of living beings? Is there a methodological reflection and representation of a dynamic conception of matter and nature not as a fixed entity but as constantly changing (Barad 2007)? Who counts as standard, as norm and normality and therefore as reference point for the measurement of the sick and the healthy body? How is this transferred into the computational artefact? Who cares?

In the paper, these questions are elaborated with examples from current applications in medical engineering.

My Smart Color-Blind Doorbell. Do Conventional Design Practices in Human Computer Interaction have Race?

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In our talk, we explore the techno-politics and techno-epistemologies of some conventional Human Computer Interaction (HCI) design practices. Against the backdrop of the common suggestion in HCI that our digital world is pluralistic and diverse, we are focusing the ordinariness of racism in the practices of (co-)designing smart doorbell cameras that highlight some pitfalls and limits of tech liberalism. Smart doorbell cameras have become ubiquitous, and can have wildly different impacts on different bodies. While HCI (co-)design practices are privileging active users who tend to understand these devices as useful, and interact with them in a playful way or rely on them for home security purposes, others could (correctly) perceive them as a

threat: Smart doorbell cameras can be weaponized against people, who may be filmed while protesting in the streets, or whose pictures may appear on neighborhood watch cameras which expose some bodies to be targets of surveillance and renders others to be safe and secure. However, the HCI research community tends to focus their efforts mainly on active, privileged users, for example when they co-design with a convenience sample which furthers the digital divide between privileged and marginalized populations, and feeds back into the incentive loop for manufacturers to mostly design technology for privileged populations, not considering or accepting that the technology that "serves" their clients may further marginalize other parts of society. In doing so, HCI is not only intersecting race and marginalization but it also reflects and reinforces off-line racism online. While the design of technologies may amplify racial stereotypes, the normality of technological racism is part of the systematic overlooking of structural effects of race on design outcomes, which is reinforcing the ordinary status of racism in our socio-technical worlds.

PS-5B: Ethics, Aesthetics and Futures of New Materialist Informatics (5B)

Time: Thursday, 25/Mar/2021: 2:00pm - 3:30pm
Session Chair: Jack Warren

Virtual Stones: Slippage and Sensation

Jack Warren

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Through the lens of queer new materialism, this paper speculates whether the stones present in the virtual ecology of the online game World of Warcraft (Blizzard, 2004-) could ever be the same as the stones composite of the Earth's geology. In his phenomenology of stone, Jeffrey J. Cohen (2015) writes of a salt-and-pepper piece of granite that sits on the windowsill of his study. Recalling Bruno Latour's slight surprise of action, Cohen remarks that he spotted the stone while walking and found himself stooping down to grasp it before he was 'aware of making a choice' (211). Communicating his geophilia, Cohen writes '[s]o many qualities of the rock allure, calling me to continued contemplation, calling me to introduce this stone to you' (212). Virtual stones are everywhere in World of Warcraft and I suggest that they elicit this same allure.

In assembling these speculations, this paper builds upon Elizabeth Grosz (2008) to understand virtual stones not as a matter of representation [signs, images, and fantasies] but a matter of sensation [force, rhythm, and resonance]. For Grosz, sensation is 'the zone of indeterminacy between subject and object, the bloc that erupts from the encounter of the one with the other' (73). Eruptions of sensation impact the body directly, skirting the brain, affecting internal organs, cells, and nervous systems – hence Cohen's slight surprise of action in his encounter with the granite. Cohen writes, '[w]hen stones are examined as something more than fixed and immobile things, as partners in errantry, then facts likewise begin to ambulate' (215). This paper puts Cohen and Grosz's ideas in dialogue with the new materialisms of Karen Barad, Mel Y. Chen, and Rebecca Schneider to posit that virtual stones are as likely to provoke sensation as their earthly and geological counterparts.

DOMESTIC DATA: TOWARDS AN AESTHETICS OF INTIMATE RESISTANCE

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During 2020 Covid-19 pandemic and rules restricting people to their homes, the adoption of Virtual Reality (VR) technologies for both commercial and leisure purposes, was unexpectedly boosted. Into this, Facebook launched the next generation Oculus Quest VR platform, with improved performance but requiring an active Facebook account to use the device, imposing on users the company's ecology of data-collection. Notwithstanding the data-capture of bodies in motion where "spending 20 minutes in a VR simulation leaves just under 2 million unique recordings of body language", the Oculus is effectively a head-mounted room-scanning device, algorithmically analysing environment and contents to spatially determine position and movement.

From this context emerges an arrangement of machine visioning hosted by the movement of the user in space, proposing the performance of an intersectional body-space hybrid of machinic aesthetics. This informatic performance is mapped to the domestic/intimate, where under the home the domestic and intimacy are of the same order, but rendered as contradiction by the techno-viewing apparatus. Notwithstanding the circumstances of VR, the troubling of domestic/intimate is already amplified by the digital re-configurations of space alienating people from the domestic through mass deployment of webcam-based 'Working From Home' practices necessitated by the Covid-19 pandemic. The domestic home, traditionally a retreat from work and labour, is institutionalised and datafied, its intimate status now precarious and dislocated.

This paper presents practice-based research interrogating the contradiction of domestic/intimate as rendered by the hybridisation of body-space machinic aesthetics. Through experimental digital practices using 3d printing and photogrammetry, the research proposes aesthetic experiences that emerge at the threshold of machine sensing and intersectional embodiment, establishing materialist characteristics for the domestic/intimacy contradiction. The practice pursues the potential for an aesthetics of resistance and counter-institutional praxis, situated between the design of interior domestic space and its postdigital dematerialisation.

Digital Images Out of Sight. The Onto-Epistemology of Non-Presence

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The Internet data is a representation and a witness of violence, sexual assault, terrorist attacks, brutal death, etc. Those phenomena are represented as digital images, which are to be 'cleaned up' by content moderators. Nevertheless, those digital images are not made invisible so much as they disappear. However, can we call an image expunged from the Web non-existent? It cannot, after all, be deleted completely. Even if we scrub it from digital media, wipe the code, and replace the old digits with new ones – reprogramming the online source – then the data that 'the cleaners' work to remove always gets stored somewhere, and that location cannot be 'cleaned up.' Deleted images are rather non-present. Their presence is founded upon visual absence – and vice versa. It is because they have been expunged that the online landscape looks as it does. Although images are supposed to present reality to us, it is precisely for that reason that some of them have to be neutralized because, as it turns out, some of them should never be seen. The expunged images unmask the aporias underpinning the onto-epistemology of the digital data. Deleting something does not snuff it out of existence – it continues to function in myriad—corporeal, local, digital, material, etc.—ways, both in the minds and eyes of content moderators and the people who created those images, as well as the memory banks of the computers and smartphones that they passed through. First and foremost, however, they are present in their absence – their very existence requires policing the spaces they function in. Thus, expunged images operate through lack. Their existence straddles the intersection of the past, the present, and the future – so the Internet exists now-here.

Charting Course: Aesthetics and Materialities of Charting Practices

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Conventional academic inquiry rarely contemplate official reports and bureaucratic documentation beyond their representational capacity—rather, these forms tend to be valued for the information they provide and are typically denied as having aesthetic or

affective qualities. However, this paper argues that these media bear numerous defining characteristics—graphic, textual, and material—that operate beyond mere representation. As this project aims to demonstrate, charting practices historically develop specific aesthetic and material qualities which endow accountability and authority beyond that granted through their content. Charting's de- and re- territorializations bear material effects. Working across historical and contemporary accounts of "charting", this paper explores the changing visual culture of informatization, rationalization, and modernization, seeking to establish how charts cultivate particular relationships to materiality. Moreover, it considers how classic modes of charting are affected by new strategies in data analysis and visualization, and questions how the aestheticization of data complicates our relations with information. Interrogating documents as aesthetic media objects, as opposed to mere carriers of information, invigorates possibilities for critical engagement. Here, I account for the ways the material effects of charting can be made affective through aesthetic inquiry.

PS-5C: Habits of Collaboration (5C)

Time: Thursday, 25/Mar/2021: 2:00pm - 3:30pm
Session Chair: Iris van der Tuin

Habits of Collaboration

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For broad and deep collaboration within academia, and between academia and extra-academic expert communities, 'habit' (Ravaisson [1838]2008, Deleuze [1953]1991, Dewey 1922, Peirce [1934]1974, Merleau-Ponty [1945]1962, Thrift 1996, Cooley 2014, Coleman 2017, Ingold 2017) is a fruitful starting point for mapping, analyzing, and mobilizing the specificity, diversity, and transformability of different ways of working within and across these domains. Disciplinarily trained academics and extra-academic experts alike have different but equally ingrained habits that inform, and are informed by, ways of working (i.e., making, learning, knowing, communicating) amongst themselves and with others, and they each have at their disposal a disciplinary set of concepts, methods, and pedagogies that rely on, and relay those habits. Habits have been formed historically in response to a changing societal context. Like schools, academies, and universities, also art, coding, and design institutions have a research culture and pedagogical mission that needs to reach a wide audience--a mission that is significantly transforming in the algorithmic condition (Colman et al. 2018). This contemporary condition is characterized by more than the pervasive use of ICTs (Lyotard 1979), as it is brought about by the complexity and dynamicity of mediatization, digitization, datafication, platformization, and machine learning, and their social, ecological, and epistemological impacts. The shift to algorithmic working calls for critical reflective strategies and opens up to creative responses to unfolding habits with/in specific collaborations. This panel makes a start with mapping, analyzing, and mobilizing 21st-century habits, thus researching (with) 'habit' across academic disciplines while reaching out to expert domains such as art, coding, curation, design, and education. In doing so, the participants wish to improve insight in and creative responses to collaborative practices. Developing collaborative habits is needed to avoid stasis and contribute to exploring natureculture and theorypractice complexities and openness, individual and collective research and learning processes.