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# THREADS & RIFTS: MAKING SENSE OF COMPUTATIONAL CULTURE

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A few weeks ago, Artemis II sent four astronauts around the Moon. Although we are repeating something from the past, it also feels that the future and going beyond the present are coming closer.

What maybe not everybody is fully aware about that for realising this kind of mission, High-Performance Computing centres (HPC), such as the one here, are essential to calculate complex spaceflight trajectories and advanced fluid dynamics, in particular for the challenging re-entry.

Quite a while back, at the School for Space Technology in Munich, one of my professors, Harry Oskar Ruppe, had worked on the Apollo mission and collaborated directly with Wernher von Braun. Although this professor was inspiring, I was not so much fascinated into rockets and satellites, but fortunately, the second professor, Eduard Igenbergs, at the school was more interested in payloads than rockets and in what the machine is actually for. That already felt like the right direction, even if the concrete topics, such as the Munich Dust Counter flying on a satellite, were a bit less my cup of tea. It was only later, at the French space administration CNES, encountering approaches shaped by cognitive psychology, that I felt I had found the question that really mattered to me: not only what a system can do, but how humans act, and live with them.

The question what kind of human existence systems can enable, stayed with me, even when I moved away from space and towards a PhD on self-organising social systems. And perhaps that is why I find myself returning to it today. Because in a way, we can again ask the same question: not only what our systems can do, but what kind of human existence they can enable. Closing the space bracket: once inside a spaceship, to a human condition that is now inseparable from the complex systems it has created.

Today our civic and creative lives more and more intertwine long-established cultural practices with powerful new digital infrastructures. What we are witnessing is not simply the adoption of new tools, it is something deeper.

David Berry (The Computational Turn: Thinking About the Digital Humanities, 2011), among others, describes this as a computational turn: the moment when digital processing ceases to be a tool applied

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from outside and becomes, instead, part of the very infrastructure through which knowledge, culture, and social life are organised.

**What emerges from this shift is what I want to call computational culture, where computation becomes part of the very conditions through which culture is organised.**

Computational culture is no longer just a set of tools we use at the edge of society, but an environment that reorganises culture from the inside - which means: it reshapes the production of knowledge, the distribution of visibility, the structuring of participation, and the negotiation of meaning. What is unprecedented - not only the speed and scale of cultural life, but also the conditions under which culture is produced and understood.

**This brings us to the core: Threads & Rifts, where the thread stands for continuity. Our culture has always been shaped by its media - by writing, printing, images, sound, screens, and the support through which knowledge is stored, transmitted, and transformed.**

**Threads:** as Bruno Latour (Technology Is Society Made Durable, 1990) said, technologies are not alien intrusions into our life; they are part of the way how social worlds are assembled and stabilised. They are cultural artifacts, embedded in histories, values, and relations. We know, that Latour was not against technology and would have not advocated that today's computation is something apart from culture, but rather one of the ways culture takes shape.

**Rifts:** at the same time Yuk Hui (Cosmotechnics as Cosmopolitics, 2017) reminds us, that continuity must not be confused with universality. There is no single technological destiny, no seamless path along which computation simply advances and installs itself across the world. It always enters particular cosmologies, traditions, and forms of life - different "cosmotechnics" - they bring with them specific assumptions and values, and in doing so they open up rifts: between worlds, between histories, and between competing ways of ordering life.

And yet the rift - the crack - is real. We live within a media flow that is continuous, accelerating, and increasingly difficult to interrupt. It no longer simply surrounds us as a stream of information, but helps organise everyday life by directing attention and shaping what becomes visible, urgent, and thinkable. Meanwhile, the infrastructures behind this flow are no longer a passive support in the background. They have become responsive and adaptive, moving between background and foreground, and beginning to resemble a synthetic sentient actor within their cultural life itself.

On the other side, the people who produce culture have themselves been changed in the process. As for example Walter and Friesike found out in a 2025 study (Behind the Screens: How Algorithmic Imaginaries

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Shape Science Content on Social Media), algorithms shape content through the power they exert over content visibility, while the rules governing that visibility remain largely opaque. Recommendation systems begin to influence not only the form of content, but also the practices of those who make it, as creators learn to anticipate algorithmic logics and adapt accordingly. Platforms do not merely distribute culture; they reshape the production thinking of the actors involved in it.

Once platforms and systems begin to shape not only what culture looks like but how it is made, a deeper question comes into view: what values are still able to orient cultural production and public life under such conditions?

When I was preparing the talk, I kept thinking about some of the orientations that have long mattered in cultural production and public life: the capacity to decide what matters, accountability, and sense-making. If computational systems are part of the fabric of culture, then the question becomes how judgment, responsibility, and comprehension can still be sustained within them?

**In that spirit, I would suggest three guiding values for orientation:**

## **CRAFT, CARE, AND CONTEXT.**

Why these three? Because together they resist three important reductions of today's computational culture: the reduction of making to production, of responsibility to procedure, and of meaning to data. As Shannon Vallor argues in "The AI Mirror" (2024), the danger is not only that machines become more accomplished, but that humans begin to surrender too much of their own judgment, care, and practical wisdom to computational systems.

These three principles draw on several intersecting traditions: Richard Sennett's understanding of craftsmanship as an ethical practice of making (The Craftsman, 2008), Maria Puig de la Bellacasa's account of care as a material and world-sustaining practice (Matters of Care: Speculative Ethics in More Than Human Worlds, 2017), and Lucy Suchman's work on situated action and human-machine relations (Human-Machine Reconfigurations: Plans and Situated Actions, 2007). To put it into a broader context, Shannon Vallor argues in her earlier book (Technology and the Virtues, 2016) that technological societies require the cultivation of technomoral virtues so that technology supports, rather than erodes, human flourishing.

In this sense, craft, care, and context can be understood as cultural orientations. As Hartmut Rosa suggests (Resonance: A Sociology of Our Relationship to the World, 2019), a world - Computational Culture

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organised around speed, optimisation, and control risks losing the possibility of meaningful relation to the world itself. That, I think, is what is at stake here.

This is also where Byung-Chul Han's critique remains important (Saving Beauty, 2017). He sees the problem in a digital culture increasingly organised around smoothness, immediate reaction, and frictionless flow. But culture cannot live by smoothness alone. It also depends on resistance, ambiguity, and moments of hesitation. A world organised around fluency and optimisation risks becoming one in which craft, care, and context no longer carry weight or create friction.

If craft, care, and context, and I would like to add trust, are what we want to preserve, then the question is how they can still be sustained under computational conditions. More than technological innovation alone will be needed. The call is for a broader cultural response in which science, technology, art, education, and public life come together to protect precisely those qualities that computational systems tend to erode.

Among these fields, art has a distinctive role, because it can make systems visible, tangible, and open to debate. But it is most powerful when understood as part of a wider set of practices that restore the conditions for judgment, responsibility, and reflection. The STEAM and STARTS initiatives are prominent examples of this.

A short while ago, I ran into former Director-General, Robert Madelin, early mentor of the STARTS initiative at DG Connect of the European Commission. When he promoted the new initiative, science, tech and arts cooperation was encouraged as a new and different way for innovation.

Now things have changed - so the next stage of collaboration between science, technology, and the arts may lie in helping us to move from innovation as acceleration to innovation as orientation: from building faster systems to shaping more accountable ones, from optimising performance to reflecting on significances, and from passive adoption to collective judgment about what kinds of technological futures are worth building them.

But this is only part of the transformation. Computational systems are not only changing how we deal with technology; they are also changing how we understand agency and intelligence. James Bridle (Ways of Being, 2022) pushes us to think of intelligence as relational rather than singular. As perception, response, and coordination are increasingly mediated by computational systems at scale and speed, intelligence and quasi-sentient behaviour become harder to be seen as exclusively human and easier to be understood as distributed across relations, systems, and forms of life.

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And going a step further, the question shifts from who possesses intelligence to how it should be understood and lived. This is where Tyson Yunkaporta's Sand Talk (2019) reminds us that intelligence is not only a matter of processing power or problem-solving capacity. It is also the ability to perceive patterns, sustain relationships, and remain accountable to a world without a master. From that perspective, the challenge is not simply to build smarter systems, but to ask whether they deepen our capacity for relation, responsibility, and attention within a shared world.

This also sharpens the political issue: as Benjamin Bratton (The Stack: On Software and Sovereignty, 2016) suggests, computation no longer appears simply as a set of tools, but as an infrastructural environment that organises how we live, act, and govern. The issue is no longer only what computational systems can do, but which values, intelligences, and forms of life they allow to appear, to matter, and to count. Therefore, the future will not be shaped by technical capability alone, but by what our systems favour, what they make visible, and what they leave vulnerable.

Coming back to the starting point: to make sense of computational culture is not only to ask what must be resisted, but also to see what is emerging: for example new forms of cultural production, new relations between humans and technical systems, and new ways of organising knowledge and attention. That is why I have argued for craft, care, and context: not to refuse computation, but to keep open the possibility of responsibility, plurality, and meaning. What matters, in the end, is whether this remains a world worth inhabiting.

*So perhaps I leave us here.*

My second space tech professor was spot-on: the most important question was never about the rocket. It was about the payload - about what we place at the heart of the systems we build, and for what we build them.

And only much later did I realise that space engineer Frank Malina had already embodied a passage from aerospace into art (On the Visual Fine Arts in the Space Age, 1970), and into the wider cultural question of what technical systems are for. This question has not changed. But the scale on which it matters has become universal - thank you.

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