(Today, e-flux journal published my third interview with Berlin-based Hong Kong philosopher Yuk Hui. Here it is. For the purists among you I am making the original email interview available. E-flux did a great job editing the piece. Whatever. Here is the original. Read and enjoy, it's heavy stuff. /Geert)

In his latest book, the Hong Kong Berlin-based technology philosopher Yuk Hui defends recursivity against mechanical repetition. He is interested in "irregularity deviating from rules." Hui develops what we could call a neo-vitalist position, which goes beyond the dominant view in today's popular cultural that there's life inside the robot (or soon will be). The organology Hui proposes is one in which a system mimics growth and variation inside its own technical realm. "Recusivity is characterised," he writes, "by the looping movement of returning to itself in order to determine itself, while every movement is open to contingency, which in turn determines its singularity."

After *On the Existence of Digital Objects* (2016) and *The Question Concerning Technology in China* (2107) *Recursivity and Contigency*, published by Rowman & Littlefield in London (2019) is Yuk Hui's third and by far most ambitious book. The study is divided into five chapters that deal with different eras and thinkers. It starts off with Kant's reflective judgement that Hui sees as a precursor to recursivity and then moves on Hegel's reflective logic that predates, and anticipates, the ways in which cybernetics functions. According to Hui's–and Stiegler's–organology, science and technology is understood as a medium to return to life, a call we should read as the opening of a true pluralism, or a "multiple cosmotechnics", to use Hui's own key concept from his previous book.

Whereas the critique of 'platform capitalism' may be necessary, our understanding of computational possibilities should not be limited to the short-term deconstruction efforts of Silicon Valley's agenda. The 'backlash' against algo-regimes, cyber-war and automation may not be immanent but Hui is already looking beyond these titanic struggles. We should not get stuck in Norbert Wiener's late scepticism about his own epistomological breakthroughs. This is how I read Yuk Hui's fabulously ambitional project to dig into the philosophical foundations of today's digitality, our episteme that presents itself as a new form of totality, or techno-subconsciousness, as I have recently discribed the regime of the digital that mhas so smoothly and intimately integrated itself in our busy everyday lives that we hardly notice its present (yet face its power even more harshly in a later instance). How

can we think individuation in an age of where the online self is surrounded by artificial stupidity and algorithmic exclusion in the name of ruthless profit maximization and state control? Is there a liberated self inside cybernetics? Can we speculate this or should we just forget about it?

I read Yuk Hui's struggle with the two key terms in a similar way as fractals and chaos theory were popular in the 1980s: they enrich, undermine and surpass the repetitive linearity of modernist industrialization. At times Yuk Hui's theory captures personal experiences we all encounter online while interacting with platforms that seem to know us, in uncanny ways while we click and swipe. I admire a crystal like this one: "What is called soul is the capacity of coming back to itself in order to know itself and determine itself. Every time it departs from itself, it actualizes its own reflection in traces, which we call memory. It is this extra in the form of difference that witnesses the movement of time, while at the same time modifying the being that is itself time, so that it consequently constitutes the dynamic of the whole. Every difference is a differing, deferring in time and being differed in space, a new creation. Every reflective movement leaves a trace like a road mark, every trace presents a questioning, to which the answer can be addressed only by the movement in its totality."

This is my third email interview with Yuk Hui. The first one for e-flux Journal was about his edited Goldsmith PhD thesis, *On the Existence of Digital Objects*, while the second one, printed in Parresia Journal, dealt with *The Question Concerning Technology in China: An Essay in Cosmotechnics*.

GL: Could you introduce the terms recursivity and contingency? How you define them, for those who have not yet read the book? How do these two terms relate to the cybernetics' central concept of feedback? Is it possible to explain potential cybernetics technologies that are not based on the principles of the current information revolution?

YH: To put it in simple terms, recursivity is a general term for looping, which is not mere repetition, but rather like a spiral, it repeats and deviates from itself every time when it calls itself. In computer programming, we learn the term recursive function designating a function which calls itself, for example, f(x)=f(x-1)+a. I was fascinated by recursion since I was a student of computer science, because it is the true spirit of automation: with several lines of code we can solve a complicated problem which may demand much lengthy codes to execute it if it is done in linear ways (i.e. procedural programming, for example, repeatedly adding until a value is reached).

However, I also extend this concept of recursivity beyond computer programming, I use it as a general name for feedback, as you know that from the so-called first order to second order cybernetics, the key term has been shifted from feedback (Norbert Wiener) to recursion (Heiz von Foester, Niklas Luhmann), for the reason that recursion provides much broader contexts to understand the application of cybernetics.

The notion of recursivity at large seems to have suggested an epistemological break from a mechanical worldview, which has dominated the 17th and 18th century, especially Cartesian mechanism. The most well known treatise on this issue would be Immanuel Kant's 1790 *Critique of Judgment*, in which Kant proposes a reflective judgment whose mode of operation is anti-Cartesian, non-linear and self-legitimate (i.e. it derives its own rules instead of being determined by a priori universal laws). The reflective judgment is central to Kant's understanding of both the beautiful and nature, that being the two parts of the book are dedicated to aesthetic judgment and teleological judgment. This is also the reason for which the French philosopher of technology Gilbert Simondon claims that only in the third critique that Kant was able to deal with cybernetics. Departing from Kant, and with a generalized concept of recursivity, I tried to analyze the emergence of two thoughts around the concept of the organic in the 20th century, namely organicism and organology. The former opens up a philosophy of biology and the latter a philosophy of life. I attempted to re-contexualize these two thoughts in the technical reality today.

Contingency is central to recursivity. In a mechanical mode of operation, which is built upon linear causation, a contingent event may lead to the collapse of the system, for example a malfunction of the machinery, an industrial catastrophe. While in the recursive mode of operation, contingency is necessary since it enriches the system and it allows the system to develop. An organism, as well as machine learning today, is that which is able to absorb contingency and renders it valuable. Contingency is no longer restricted to the question of modality developed by Kant and more recently by the French philosopher Quentin Meillassoux. Though Meillassoux claimed to have developed a new epistemological foundation, I am afraid that it is far from being satisfactory. In the book I engaged with Meillassoux to work out a positive use of his concept of 'absolute contingency'. Therefore you see that recursivity and contingency are two fundamental concepts which I employ to unfold a particular history of philosophy from Kant to Schelling and Hegel, till Whitehead, organicism and

Cybernetics.

GL: Cybernetics feedback concept with the closed box science approach, give rise to the automation tendency. How can we overcome this?

YH: The automation tendency is very much discussed in the book though not in a journalistic way. If in the time of Descartes, as well as Marx who described the human-machine relations in the factories in Manchester in the 19th century, an automatic machine means that which performs homogeneous repetitive work; in our time, an automatic machine is no longer based on the same epistemology, but rather it is a recursive machine which is capable of integrating contingency into its operation. We may want to call it the basis of machine intelligence. I didn't only deal with Wiener and his colleagues, but also elaborated on the concept of recursivity in Gödel, Turing and Church which leads to the invention of the modern computational machine. Gödel's recursive function which aims to be a mathematical proof is a much more advanced form of automation that is equivalent to the Turing Machine. This mode of operation (i.e. recursivity) which is essential to contemporary machineries has been obscured by various way of describing capitalism, due to the fact that Marxists are used to take information technology in too much abstract terms, for example, immaterial labour, free labour. I think Deleuze has attempted to describe it in his famous "Postscript on Societies of Control," but he lacked the vocabulary to do so, and simply take the concept of modulation from Simondon.

If we want to overcome it, we need to understand its significance, and find ways to describe it and analyze it. Cybernetics marks the end of philosophy and its completion according to Martin Heidegger. As a response to Heidegger, I want to re-contextualize cybernetics in the history of philosophy in order to expose its limit sand its potentials. In order to do this, we will need a new language and new concepts. This is why the book is titled according to two concepts, recursivity and contingency. With both concepts, we also analyze the theoretical ground of both organicism and organology. Organicism could be divided into a philosophy of nature (for example Schelling, Needham, Woodger, Whitehead among others) and a mechano-organismic thought which bears the name cybernetics and later systems theory. With the historical analysis, we can think recursivity beyond cybernetics, this is reflected on how the book is constructed: the first two chapters are dedicated to organicism from Kant to cybernetics via Schelling, Hegel, Wiener and Gödel; and third and fourth chapters are dedicated to

organology from Kant to Bergson, Canguilhem, Simondon and Stiegler, and my own reflection of this tradition; the last chapter wants to unfold a political philosophy against the totalizing tendency of the far too humanist modern technology.

GL: What's mechanism today in a world where digitization takes command? I ask this because I am looking for an alternative inroad into your thinking. The critique of the 19th century mechanistic worldview that explains life without life seems to be a no brainer. The 'organic' perspective is the dominant one today. Why is it nonetheless necessary to distance ourselves from the mechanic? Is it still a living ideology? Do you see any role for 'neo-mechanistic' operations in, let's say, the way we look at a smart phone? Most software operations are dead and predictable. So much is automated today. Why shouldn't we perceive this as mechanistic? What do we gain by looking at killer drones as organic modes of operation?

YH: What you call neo-mechanism is what I call in the book a mechano-organicism, which is also cybernetics. Indeed, if you wish, we live in an age of neo-mechanism, in which technical objects are *becoming* organic. Towards the end of the 18th century, Kant wanted to give a new life to philosophy after mechanism by setting up a new condition of philosophizing, namely the organic. Being mechanic doesn't mean being related to machines, but rather machines that are build upon a linear causality, for example mechanical machines like the clock, or later thermodynamic machines like the steam engine (though James Watt already employed certain feedback mechanism). When I say organic as the condition of philosophizing, it means that for philosophy to be, it has to be organic. Therefore with the post-Kantians, such as Fichte, Schelling and Hegel, there is a strong organic mode of thinking, ranging from philosophy of nature to political philosophy. And if philosophy since Kant has mechanism as its counter part, it seems today, as you and others have observed, this counterpart has been transformed into an organic being. Our computers, smartphones, and the domestic robots are no longer mechanical but rather becoming organic. I proposed this as a new condition of philosophizing, that philosophy has to painfully break away from the self-contentment of organicity, and opens up new realms of thinking.

What I wanted to elaborate in this book is not only a history of philosophy and a history of technology, but rather to ask, what comes after this organic mode of thinking which is still considered as a remedy to industrialism

today, though both the actualities of machine and industry in the 21st century are no longer the same as they were hundreds years ago. A false analysis can be misleading and also harmful for the understanding and assessment of our situation today. Philosophy has to negate this totalizing tendency in the organic thinking, which is in the process of being implemented in different technical apparatus, from social credit systems to the fanatic super intelligence. I think Jean-François Lyotard has already reflected on this some 40 years ago in his *Postmodern Condition*, especially his critique against Luhmann's systems theory, and one should re-read Lyotard carefully. This is why my last chapter is dedicated to Lyotard and the 'inhumanism' that I want to elaborate on as a philosophy of fragmentation.

GL: You write that for a vitalist such as Bergson artificial systems are mechanical and not real. "Science when it becomes mechanical, prevents us from comprehending the creativity which is life itself. Life is a recursive process of making in the unmaking. In this passage you quote Canguilhem, the mentor of Foucault, who argued *in Knowledge of Life* from 1966 that we should "rejoin life through science."

YH: Bergson was a philosopher who opposes the organic to the mechanical. This was due to the historical background that we briefly mentioned before, the 20th century being the age of mechanism, physics and industrialism. Bergson published in 1907 *Creative Evolution*, which for Canguilhem, together with the journal *L'année Biologique* launched in the same year, marked the birth of a philosophy of biology in France. It was also Canguilhem in his 1947 essay "Machine and Organism," who proposes that there is a general organology in Bergson's *Creative Evolution*. The return to life is a return to an organic whole which renders the mechanical part possible. This organic whole takes the name of élan vital in Bergson. Life is a recursive process, it is a constant exchange between the figure and the ground (if we take the Gestalt vocabulary here) through a process of making and unmaking. This is also why evolution is creative, since it is fundamentally organological in the sense that evolution is also a process in which human beings are obliged to constantly create new organs (e.g. figures), while not being blinded by them, i.e. considering them as the totality of reality. Mechanism wants to explain life, without realizing that it is only a phase of life, e.g. being figure, while Bergson wants to resituate mechanism in a broader reality which is life itself. So you see that Bergson is not against science nor even mechanism, but rather the fact that science becomes merely mechanical and ignores life. There is basically no opposition

between Bergson and Canguilhem, since both of them reject the proposal to explain life without life, and they want to "rejoin life through science."

GL: Should we no longer be concerned about the uncritical use of biological metaphors in technological and social contexts? I come from a political generation where this was openly questioned. Why do you speak of the 'evolution' of systems? What do we gain by speaking of 'emergence', knowing that all these technologies are conciously fabricated by human aka male engineers? One could say that Norbert Wiener and the others also never questioned all this so why should we? 'This is cyber age so shut up with your anti-fascist sentiments'. We are all cyborgs and can by definition no longer subscribe to 'team human', as Douglas Rushkoff coined the resistance forces against algorithmic suprimacy. Why does the critique of artificial intelligence and machine learning has to be based on an 'organology'? Isn't that view part of the problem?

YH: Lets recall that in 1948, a year after Canguilhem's essay "Machine and Organism," Norbert Wiener published his most important book *Cybernetics, Control and Communication in Man and Animal*. Its first chapter is entitled "Newtonian and Bergsonian Time," in which Wiener claims that cybernetics has already overcome the opposition between the Newtonian reversible and mechanical (in the sense of linear) time and the Bergsonian irreversible and biological time. Wiener claims that "The modern automation exists in the same sort of Bergsonian time as the living organism, and here there is no reason in Bergson's considerations why the essential mode of functioning of the living organism should not be the same as that of the automation of this type…In fact, the whole mechanist-vitalist controversy has been relegated to the limbo of badly posed questions." What Wiener says is decisive since he declares that technical objects are becoming organic, and this partially constitutes what I call a new condition of philosophizing.

How do we reflect critically today when certain dualist logics are overcome, while critique of dualism remains canonical for what concerns overcoming modernity? This has been the aim of my book. What does it mean that one becomes cyborg? Donna Haraway was, or she has been always, an organicist. Her work was significant in the 1990s for what concerns the overcoming of the dichotomy between the mechanical and the organic. However, it was already the very end of the completion of the organic mode of thinking. Maybe today we should reconsider all these from the new condition of philosophizing that I proposed in this book and that I tried to

explain above. To put it in concrete question: does someone have an artificial arm and an artificial eye necessarily against the human since the organic and the mechanical are no longer opposed? Or in the contrary, that transhumanism, with the belief that the whole body could be replaced and enhanced, still built upon a linear way of thinking, and expresses an extreme humanism? Transhumanism, from the surface, seems to want to get rid of the conept of the human, however this gesture is only a camouflage, because it is the most humanist approach to the world, since all is captured in a metaphysical gaze.

How helpful is it to think from the perspective of organology? The term general organology was coined by Canguilhem in 1947 in his reading of Bergson's *Creative Evolution*, but it was Bernard Stiegler who elaborated on the subject more than anyone else. Stiegler developed this concept around 2003 while he was the director of IRCAM of the Centre Georges Pompidou, an institute dedicated to experimental music, and the term organology comes from music instead of Bergson. Albeit the different motivations of their philosophy, they all point to the question of human life which can only be maintained through the organization of the inorganic, i.e. the invention and use of tools. Maybe we want to raise the question in this way: will the development of artificial intelligence and machine learning allow us to rejoin life? Or the current logic which is based on replacement an erroneous thinking which will only lead to misery of our time as it is happening now, considering the outcry of massive unemployment?

Lets move a step further, what if these machines are no longer simply organized inorganic, but rather they are becoming gigantic systems, or what I prefer to call "organizing inorganic." The evolution of technical object to technical system was main focus of *On the Existence of Digital Objects*, and it is further elaborated in *Recursivity and Contingency*. They are now the organizing body of human lives and social orders, the object of technocracy. It seems to me necessary to return to these questions and to extend the concept of organology already developed by anthropologists and philosophers to the analysis of our actual situation.

This questioning is also the point where organology and cosmotechnics meet, meaning that organology should think beyond the human, and therefore the human body, to the cosmos. Or to be more precise, for me the question will be how to resituate modern technology in a broader reality, or that which we call the ground, or cosmic reality. I am convinced that this

was what Gilbert Simondon wanted to do in the very obscure part III of *On the Mode of Existence of Technical objects*. §38 of *Recursivity and Contingency* is titled "The Principle of Ground" which is a retake on Heidegger's famous *Der Satz vom Grund* as well as Deleuze's notion of transcendental stupidity in *Difference and Repetition*. The discussion on organology is a reflection on the relation between human, cosmos (world) and technology.

GL: Towards the end of book you ask the question if recursive thinking will allow us to the relaunch the question of organicism and technodiversity or if it will be only used by a deterministic system "that is moving toward its own destruction." We know about the reductionist school of thought, it has taken over the world. How about the nonreductionist one, "which seeks genesis beyond any form of technological determinism? What can people do to become part of that school? Is it a movement? Which forms of organizations do you envision that school could take? A Frankfurt school? Bauhaus? What are the contemporary examples that inspire you?

YH: You are absolutely right, this has to be a new movement, or a new school of thought which demand us to develop different understandings and practices of technology. Maybe we should revive some Black Mountain Colleges to do so, since it will demand first of all a new syllabus and new forms of collaboration, which allows us to transform the industrial world. On my part, I established a research network called "Research Network of Philosophy and Technology" in 2014, and we have been trying to establish collaborations between different institutes and individuals, however it is still far away from being there. I believe that this has to be a collaborative project and we will need participations of researchers who share the analysis and problematics.

GL: Are cybernetics the metaphysics of today's world? Heidegger may have predicted that philosophy was going to be replaced by cybernetics but in these regressive times we see no signs of this–at least not in the Western academic world. Philosophy of technology is a marginal if not non-existing sub-category. The same can be said of digital studies and even internet studies. The humanities approach that is not data-driven is in fact fading away as 'new media' turn out of fashion and are replaced by internal research methods and archiving questions, supported by newly established tiny 'digital humanities' departments that have been giving the unholy task of innovating a dwindling field of knowledge from the inside. What's to be

done? Is it time for a radical reform of the faculties? How we scale up these efforts?

YH: In *Recursivity and Contingency* I try to show why Heidegger was right concerning the end of metaphysics and also why it is necessary to think beyond Heidegger. In 1966, when Heidegger was asked by journalists from *Der Spiegel* what comes after philosophy, he replied: cybernetics. The organic is, for Heidegger, nothing but the mechanical-technological triumph of modernity over nature. There is an astonishing insight in the thought in Heidegger. This is why I think the organic mode of thinking, which we relate to ecology, to cybernetics, to Gaia theory, etc. are manifestation of this "end." The question is how to think beyond this end? This end is also the accomplishment, when Heidegger in his 1964 essay "The End of Philosophy and the Task of Thinking," says that this end means that the world-civilization will be based on Western European thought, it is at the same time assertive and provocative. This rejoins the task of my second book *The Question Concerning Technology in China. An Essay in Cosmotechnics*.

The cosmotechnics concept is central to *Recursivity and Contingency* since it proposes to reconstruct different technological thoughts as possibilities to reframe what Heidegger calls *enframing* (Gestell), which is the essence of modern technology. I am not proposing to abandon cybernetics but rather to expose its limits and potentials. In the book there is a dialogue between cybernetics and Chinese thought through the figure of Joseph Needham, it is something that I continue elaborating in my current writing.

If you wish, you can also see *Recursivity and Contingency* as a footnote to §17 of *The Question Concerning Technology in China*, where Needham's characterization of Chinese philosophy as organicism was discussed. In *The Question Concerning Technology in China*, I use China as an example to argue for a Chinese technological thought which is grounded in different understanding of the cosmos and the moral. I am glad to see that this proposal has been welcomed in China, Japan and Korea (largely because of the similarity of thought), and some younger scholars are enthusiastic to engage with it. The Korean translation has already come out, and the Chinese and Japanese translations will come out later in the year.

If we follow what Heidegger says that the world civilization is now completely based on Western European thought, this end is also a call for other thinking. This is the reason for which I propose to think together a fragmentation based on cosmotechnics. Will the global south be capable to

rediscover their cosmotechnics and their technological thought, and therewith give new directions to technological development? Will the defeat of Huawei in the recent political struggle between the USA and China force Huawei to develop a distinct operating system, or only another Android coded in Chinese language? This is decisive for a new technological agenda as well as a new geopolitics to come.

You are right that today every discipline wants to have Artificial Intelligence, Machine Learning and big data as their research subjects, we can see in sociology, architecture, philosophy, anthropology, media studies, natural sciences as you can name, though as you said, the research questions are rather narrow, and very limited to the agenda of "digital humanities." It is not that we are against "digital humanities" as such, but rather the agenda is far too limited. I remember two years ago I was invited for a job interview by a department of digital humanities in England, and afterward, I was told, with certain regret, that they don't need philosopher at the moment.

It seems to me that technology becomes that which converges different disciplines, or in other words, different disciplines want to respond to the challenge of technology, will this call forward some radical technological thoughts which are not limited to the 20th century media theory, philosophy of technology and literature studies? Digital humanities is still not a global discipline, maybe in its process adopting it, one should question it and redefine it. I think this is what researchers from different disciplines have to think together, and to take this opportunity as one that will allow us to rethink the condition of the existing disciplines and allow new thoughts to flourish. You asked about philosophy of technology. I rarely present myself as a philosopher of technology unless in occasions when one is forced to choose a narrow discipline. Like Stiegler, I tend to believe that technology is the first philosophy, such as what he attempted to do by deconstructing Western philosophy. Philosophy has been always conditioned and called forward by technological conditions of its epoch. I tend to believe that we will have to take very seriously the new condition of philosophizing after Kant's *Critique of Judgment*. We will have to contest against the gigantic metaphysical force that is in the process of conducting us to an artificial earth and a totalizing system of governance proposed by transhumanism. If cybernetics marks the end of metaphysics as Heidegger declares, will the future non-metaphysical thinking be able to respond to it by reopening the question of technology and *reframing* the *Gestell* (*enframing*) instead of just retreating to artistic representation and science fiction? We are in a time,

which demands radical thinking and new forms of institutions in global scale. I guess it may take a considerable amount of time for this to happen, however, at least we should all try our own part to seize this opportunity.

GL : The gap between intense use of digital technology and the fundamental understanding of the transformations caused by these technologies is growing by the day. What would you suggest to bridge this gap ? I don't see this happening in Europe, a continent that is rapidly closing in on itself, becoming more and more regressive. Should we aim our hope for theory made in Asia? Or should we perhaps think more of distributed networks of knowledge production ? Cybernetics is a vanished meta-discipline, much like mass psychnology—a discipline that I studied and then witnessed staging its own disappearance, also in the 1980s when cybernetics was about to be closed down. What do you think of a radical collective imagination of something altogether new?

YH : As I said, we will need to rethink the education system and division of disciplines that we have adopted in the past decades. It is probably not possible to bridge the gap between the already existing disciplines, since when you attempt to bridge the gap, it at the same time maintains this gap. One possibility is to create a new discipline in which this gap no longer exists. I spend more than a decade studying in England, France and Germany, and I love Europe in my heart, but I am afraid that Europe will be impoverished by its increasing racism and conservatism. I wouldn't want to say that new thoughts will come out of Asia instead of Europe, but I do believe that such thoughts can only emerge out of the incompatibility between two systems of thought, since it is the incompatibility between them that leads to the individuation of thinking itself, but not subordination nor domination of one and the other. However, I am not sure if Europe is ready for this. It seems to me of ultimate importance to rearticulate the relation between philosophy, technology and geopolitics today, which I am afraid remains largely unthought. It doesn't mean that Asia needs to develop new thought to defeat the West, in the contrary a thought is singular in so far as it is possible to respond to a global situation and remains consistent with itself. Will Asia be a new land for contemporary thought? I can only hope so, there are also many institutional barriers.