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Digital Simondon: The collective individuation of man and machine

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Simondon's theory of individuation is the dynamic world process by which everything arises: technology, living beings, individuals, groups and thoughts. The full subjectivation of the individual requires both individual and collective individuations. This paper examines how the Contemporary Media Environment (CME) may be influencing the realization of individual and collective individuations as specified by Simondon. The CME is the current situation of the widespread connected world of computing, and the pervasive presence of technology in an increasingly rich information environment between and amongst human and machine entities. The CME is further distinguished by its use in all manner of human activity, and the increasing emergence of technology as "the other" in the human-technology relation. The CME might stimulate greater activation of individuation, both individual and collective individuation, and also now collective individuation with machine others as group members. In the case of individual individuation, CME technologies might facilitate the three types of individuation: self-world incompatibilization, "exceeding the self" incompatibilization, and "Zarathustra moments" of disindividuating individuation. Likewise in the case of the collective individuation, CME technologies might facilitate the structuring of emotion or other input signals across a group that then causes the collective individuation. In the case of human-technology individuations, the CME is the venue, facilitating mechanism, and mediator of collective individuations amongst human and technology entities. One worry might be that the CME infantilizes humans, but the opposite is true. The individuation possibilities afforded by the CME could lead to a deeper and more integrated partnership between humans and technology, and smoother transitions to a future of a multispecies intelligence. Productive interaction between intelligent species could be fostered through the notion of being joined together in the common framework of a capacity spectrum for mutual individuation in digital society.

When considering Simondon and the Contemporary Media Environment (CME), the first reach might be to his masterwork, *On the Mode of Existence of Technical Objects* (MEOT; Simondon, 1989a). Here he sets forth a detailed account of the different ways or modes in which technical objects exist, the causes of their evolution, and their position with regard to human culture and society. While this provides a good foundational understanding of technology and the CME, Simondon's philosophy also prefigures something more profound. Another of his centrepieces, the theory of individuation, anticipates not just the full subjectivation of the individual, but also that of the collective (Simondon, 2005). Individuation is the dynamic world process by which everything arises: technology, living beings, individuals, groups and even thoughts. Simondon allows an awareness of the individuation process of individuals and groups, and what may be next for human collectivity, some phases that have already been effectuated, and others that are just starting to unfold, such as the mutual co-individuation of humans and technology. The aim of this paper is to consider how Simondon's theory of individual and collective individuation applies to the CME, and the potential for the CME to facilitate the individuation of the individual and the collective.

What is the Contemporary Media Environment?

The CME is the current situation of the widespread connected world of computing, and the pervasive presence of technology in an increasingly rich information environment between and amongst human and machine entities. Three features distinguish the CME: the connected world of computing, the use of the CME for all manner of human activity, and the increasing emergence of technology as "the Other" in the human-technology relation.

The CME is the connected world of computing

The connected world is the conceptualization and experience of a continuously-connected seamless layer of computing devices blanketing the world. Any and all computing devices may be connected to the Internet, which makes them available to send and receive information, and conduct on-demand operations at any moment. Connected devices may include wearables, smartwatches, smartphones, tablets, laptops, video-gaming consoles, quantified self-tracking devices like Fitbit, Internet-of-Things (IOT) sensors, personal robotics, artificial companions, connected cars, and smarthome and smartcity sensors. Further, the connected world comprises not just the usual computing devices, but also the idea of "smart matter," where everyday objects like thermostats, scales, clothing items, washer-dryers, roads and buildings are increasingly coming online.

The process of potentially Internet-connecting all people and all objects is underway. The majority of individuals worldwide are estimated to be online by 2020 (Marsan, 2010). The rate of object connection is even faster. Thus the connected world is a venue for all forms of human and machine communication. Another property of the connected world is "big data crunching." This is the vast volume of data flows resulting from connected entities and the implied cloud-based algorithmic processing of these data. People and machines are continuously uploading information to the cloud, and deep-learning neural networks crunch these data in the background and process them back as real-time personalized recommendations, notifications and alerts. This means that humans are developing a wholly different relation to data. The human-data relation is one in which there is a notion of a "vast data other" being omnipresent in the cloud, hewing to unclear purposes, most likely those not controlled by individuals. (Swan, 2015d). Where formerly all data was signal (each appointment on a calendar is salient), now 99% of data are noise, and CME tools must help humans localize signals. Information-richness is also shifting the way that humans conceive and interact with the world, from what necessarily had to be a mode of reactive response, to one that is now proactive and predictive (Swan, 2015c).

The CME is the venue for all human endeavour

The CME is not only the venue for all human and machine communication; it is also emerging as the venue for all human activity, or at least its partner and accompaniment. The CME is the venue for every form of personal and professional endeavour. This means in prominent life categories like work (enterprise software, intranets, job search and eLabor marketplaces), social interaction (email, texting, photo-sharing, social networks and dating), finance, economics and eCommerce (purchasing and selling items and asset management), and entertainment (TV, movies and video games). All other life categories can also be conducted via the CME such as obtaining news and information, education (massive open online courses, and online and distance learning), health management (information-seeking, service provider interaction, health social networks, self-tracking and health research studies), and personal contribution (charitable organizations, citizen science websites and problem-solving communities like Foldit, EteRNA and SETI@home).

The CME includes new media, but is a broader category. New media denotes digital content like text, audio, pictures and video that is made and stored in the 1s and 0s of computer code. The digital content can be delivered via different media, like radio, television, compact disks and digital video disks. The Internet is the communications platform on which digital media content can be delivered to a wide variety of devices, including desktop computers, wireless laptops, smartphones and other mobile devices (Nestor, 2011). Some key features of new media are its real-time on-demand dynamism and interactivity, for content access, production and modification, and the possibility for users to interact with the content, modify it and share it with others. Since anyone can create, publish, distribute, or otherwise participate with content at any time, new media is seen to have the property of democratization (Socha, 2010). The CME comprises all of this but is broader, first because users exhibit interactions that are a blend of both traditional and new media interactions (Flanagin, 2001), and because the definition given here of the CME as the connected world of computing is broader. The CME is an indispensable venue for the conduct of all manner of human activity, going beyond digital content production, consumption, and interaction to every personal and professional area of human endeavour.

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The CME reflects technology and information as "the Other"

A third feature of the CME, particularly produced by the CME as the venue for all of human and machine communication and activity, is the increasing emergence of technology as "the Other" in the human-technology relation. The CME is an information-rich environment in which both humans and machine entities participate. Humans are now in a wholly new situation with technology and information, where non-human entities are the primary other party in the majority of interactions (Floridi, 2014). Technology is "the Other" with whom humans are engaging the most. The theme of the "technology Other" has often been explored in film, with the increasing trend of humans and technology being portrayed in full partnership, for example in *Big Hero 6* (2014), *Her* (2013) and *Robot & Frank* (2012). Another way that the CME is manifesting the technology other is through embodiment, and in an escalation in the forms and types of human interaction. The technology other is no longer conceived narrowly as Amazon and Netflix recommendations, but instead may be a fully-embodied agent. An example of this is robotic personal assistants for home, and work like Robotbase's Personal Robot, MIT's JIBO and Amazon's Echo. A sense of embodiment may also be perceived with advanced voice assistants like Apple's Siri, Google Now and Microsoft's Cortana. The technology other is also seen in that the best "worker" for many contemporary jobs is a human and a machine in collaboration (Cowen, 2013). The CME is redefining the human-technology relation such that technology is the full other, where the CME's position is both as other and self-world mediator.

Simondon and the philosophy of new media

The CME offers many affirmative possibilities for human existence, but is also a venue for fear and uncertainty. Different views are highlighted in the philosophy of new media. Theorist Lev Manovich attempts to distinguish how digital media is different and illusory, for example in regard to reality, viewer interaction, and space (Manovich, 2001). Another view is that the impact of technology is pervasive and inevitable, such that "the [CME] determines the way we conceive reality, human life, and mind" (Canan, 2014). Other views are cautionary, as Mark Hansen discusses ideas from Paul Virilio, Jonathan Crary, and William Mitchell in *New Philosophy for New Media* (2004). These are summed up in an early critical position advanced by Baudrillard: "Electronic digitality has been accused of eviscerating the real and liquidating reference, truth, and objectivity" (Lenoir, 2004). The central issues are the status and nature of reality, and the situation of the subject as potentially being disembodied, dematerialized, and dehumanized.

The issue about truth and reality is quite valid – it is increasingly difficult if not impossible to discern what is "real" in the CME in cases ranging from images to people. The CME provides a panoply of ways to create images and "person entities," whether real or simulated. However, since reality multiplicity is a feature of the CME, a more productive reframing of the question of truth could be to focus on the qualities of representation in the gradation of a Simondonian capacity spectrum. Digital entities could be seen as existing on a capacity spectrum for the expression of authenticity and validation in representation. Simondon might also be mobilized to address the concerns about the subject and reality. The different forms of the subject (disembodied etc.) can be seen as versions that more and less effective individuations.

Simondon's worldview and individuation

The worldview that Simondon puts forward is one of dynamic processes, metastable equilibria and networks of relations. Subjects and groups do not self-constitute but arise as an effect of individuation. Individuation is the process of the formation and structuration of distinct entities like human beings and groups. Life is a never-ending succession of individuations or becomings. A living being becomes a subject through successive individuations. Individuations have both an internal and external side, and transindividuation is the interplay between interiority and exteriority, which are separate but connected in an ongoing relation. The individual individuation is comprised of two individuations: one interior to the individual (the psychic individuation), and the other exterior to the individual (the collective individuation). The psychic individuation is the formation of the psychology of individuals, and the collective

individuation is the formation of how these individual states are linked to the wider external world. The psychic individuation is itself composed of individuations of perception and emotion, where perception resolves self-world incompatibilities, and emotion operates the self-self and self-world relations. The collective individuation is needed because incompatibilities with the associated milieu cannot be fully overcome internally. Collective is meant as the collective individuation of the individual, and also in the sense of the collective itself, as a group or society. Individuals and groups are not opposing, the individual and the collective are both effects of the continual world process of individuation.

CME facilitates the individuation of the individual

The CME facilitates the individuation of the individual in ways that were not possible previously, in each of the three ways that the individual individuation arises, through incompatibilization problems with the environment, the subject's anxiety at exceeding its individuality, and in "Zarathustra moments" with another person as other.

Incompatibilizm problems between self and world

A subject and world are constantly in tension. A living being faces incompatibility problems with the *associated milieu* (world or environment) such as discomfort, hunger and emotion. The compatibilization of the living being to the milieu is a process where through perception the subject ideates and invents a new form or model with the goal of resolving the incompatibility problem. Perception and ideation is "an act of individuation operated by a living being to resolve a conflict with its milieu" (Simondon, 2005, p. 264). In the CME, a subject may face more self-world incompatibilizations due to reality multiplicity. The CME gives rise to many different environments: there is the traditional "found reality" of the physical world, plus the many "manufactured realities" of the digital world. Since the subject may be operating in different worlds, and incompatibilization is a feature of self-world interaction, there is the possibility for more incompatibilizations, and therefore more individuations. CME technologies already draw attention to self-world incompatibilizations at the basic level, for example notifications of being late, canceled meetings and traffic status. Next generation interactions could be more robust as the CME could facilitate the subject's individuation through a greater presentation and mediation of self-world incompatibilizations.

The rate of new ideation is greater in the CME than in the traditional physical world. Social networks allow individuals to be exposed to more ideas more rapidly than has been possible before (Pentland, 2014). Thus CME technologies might be developed to more directly target ideation, and help identify, resolve, and even catalyse self-world incompatibilizations. Incompatibilization is the idea of personal growth by breaking out of comfort zones. One possibility for this is through the fourth-person perspective that arises through the ensemble of connected world quantified-self tracking devices (Swan, 2014b). The fourth-person perspective is a new way of seeing the self through the private eyes of personalized technology, an objective metrics perspective that has been previously unavailable. Without the biases of other perspectives, the CME-mediated fourth-person perspective provides an intimate and objective look at behavior from the stance of a non-judging merely-reporting other. This is an example of technology-as-other; CME gadgets are the technological other, the alterity that provides a new means for humans to see themselves via exteriority.

Anxiety: The subject discovers that it exceeds its individuality

While self-world incompatibilizations can be resolved internally through perception and ideation, other incompatibilizations require external resolution through affectivity and the collective. The second means of triggering the individual individuation is through moments of anxiety when the subject discovers that it exceeds its individuality. A central idea for Simondon is unrealized preindividual potential, which is "the ether of reality" in the sense of unindividuated potential being infinitely available for individuation. Subjects are always more than the currently-existing individuals because they are composed of both already-realized individuations and the preindividual potential for new individuations. Being is not reducible to already-realized individuated being since subjects are continually constituted by new and ongoing individuations. Since the subject is both individual and more-than-individual, it means that it is

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incompatible with itself. This gives rise to a specific kind of incompatibilization problem between the currently-realized self and the potential self. The subject becomes aware of the exceeding-the-self incompatibilization problem through an emotional trigger. Emotion in the form of anxiety is the experience of the individual discovering this incompatibility; that it has within it that which exceeds it. An example of this in daily life is a moment of becoming aware of your true potential, and realising that you are not living up to it. Overall in some sense, an individual can be seen as "a mode of management of instability and excess" (Grosz, 2012, p. 39).

The lived experience of self-incompatibilization anxiety could be either great or horrible depending on one's perspective and perhaps the CME can render these moments in ways that are helpful for individuation. On one hand, self-incompatibilization anxiety is hopeful and liberating because it means that the subject is not static or fixed and can always grow and exceed itself. The possibility of becoming more and the fact that such potentiality is a fundamental constitutive dimension of the subject is generative and optimistic. On the other hand, the actual lived experience of self-incompatibilization anxiety can be a hideous conflict. The tension can only be resolved in the collective (external) side of the subject's individuation and not internally because the internal solution would be to individuate all remaining preindividual potential at once, which is impossible, or would be death. In some sense then, anxiety is "the highest achievement that a being on its own can attain as a subject" (Combes, 2013, p. 33), since it promulgates action-taking by the subject towards the collective, and results in individuation.

As the CME brings more self-world incompatibilizations with reality multiplicity, so too it brings more self-exceeding experiences. Numerous new forms of self-incompatibilization anxiety are available in the CME due to the physical limits of participation and emotional stress. Emotional stress may arise from the feeling of needing to be constantly online-connected (Fitzgerald, 2012), approval-seeking, fear of non-belonging and non-inclusion and the desire to be "liked" (Feilermay, 2014). In some sense, the "keeping up with the Joneses" mentality has been transmogrified in the CME: instead of meaning the acquisition of status through monetary currency and material goods, it means status acquisition through the new digital currencies of reputation, intention and attention. CME properties like Instagram, Facebook and Twitter inform you of the activities of others in real-time such that there is not just the fear of missing out (FOMO), but in fact the *proof* of missing out (POMO). For Simondon, however, the increase in self-exceeding incompatibilization problems per the CME can be seen as positive since it is a catalyst for individuation.

Transindividual individuation: "Zarathustra moments" with another person as Other

The third trigger for individual individuations is "Zarathustra moments," or transindividual disindividuations. The functional social relations of traditional everyday interaction can be an obstacle to the discovery and effectuation of preindividual potential, and therefore individuation. What is needed is an exceptional disindividuating event to strip a subject of its usual social function and reveal its preindividual potential to others. Simondon finds an example of this in Nietzsche, where Zarathustra sees a tightrope walker fall and die. Shifting the ropewalker out of his usual social role as a performer leads Zarathustra to see the ropewalker's preindividual potential directly, and through that, his own preindividual potential (Simondon, 2005, p. 280). An observer sees the preindividual potential in the other at the moment of the shift in functional social relations, which causes the subject to become aware of his own preindividual potential, and thus become engaged in a subjectivation ordeal called forth by the anxiety of this discovery. This process disindividuates the subject: the transindividual disindividuation loosens the subject's constituted individuality, which is engulfed by the preindividual, and conditions a new individuation (Combes 2013, p. 38). The break with functional social relations is important not only to abruptly show the other in a non-usual role, but also to strip the sense of one's own belonging to a social community so that a new individuation may be effectuated.

The structure of the Zarathustra moment is that a disindividuating event removes a subject from its usual social function and reveals its preindividual potential to others, which causes another subject to become aware of his own preindividual potential, and individuate per this discovery. However, the way that social functional relations are reflected in the CME is not generally such that there is a disindividuating event that strips a subject their functional identity. Instead it is the opposite; others are

not stripped of their identity to appear in a generalized state, but appear as an even-more purified version of themselves due to context-specificity. Individuals may not be seen as full persons in the CME but only as their digital identity in specific situations, such as a health social network, or software developer forum. While a key feature of the CME is reality multiplicity and digital identity multiplicity, any one presentation of identity may be highly specific, even if profile details are available about the full-person identity. Thus the encounter with the other does not occur as a removal of social functional identity, but as a concentrated context-specific interaction. Thus Zarathustra moments might be less available in the CME.

However, while the Zarathustra moment triggers the individuation in the Simondonian case, it could be that the stripping of social functional relations does not matter, it is just one mechanism, and that individuation can be accessed alternatively. The structure of the Zarathustra moment was not required in the other two modes of triggering individuation, self-world and exceeding-the-self incompatibilizations. The salient structural element of the Zarathustra moment is a disindividuating encounter that gives the subject access to the collective or exteriority, whereby they can see themselves differently. The link to exteriority through the transindividual relation is what is crucial, where the transindividual relation is the interplay between interiority and exteriority.

The transindividual disindividuation works because it produces an exteriority. Through the disindividuating relation to the other, the subject is able to appear to itself as a subject and capable of having a relation to itself. Notably, it is the other (an exteriority), that provokes the relation to the self, not an internal process that produces the self-self relation. The other, not the self, is required for the self to have a full relation to itself. How this happens is that when the other is no longer encountered on the basis of its social function, it becomes that which puts the subject into question, forcing the subject to no longer perceive itself through the intersubjective representations of sociality but directly as preindividual potential. However, other mechanisms, like the fourth-person perspective afforded by the CME, can foster the disindividuating encounter such that the subject is able to appear to itself as a subject and capable of having a relation to itself in a new way. The CME's fourth-person perspective grants the same nakedness of the anxiety-inducing Zarathustra moment such that a different relation to the self is possible.

CME as a catalyst for individuation

The transindividual relation is the self-constituting relation of subjects to themselves that happens through their own disindividuating encounters with the Other or any "Other" including technology-as-other. Any mechanism can potentially provide the requisite alterity for the disindividuating encounter, it does not have to be another person stripped of their social functional relation in a Zarathustra moment. The transindividual relation, as the interplay of interiority and exteriority that triggers a subjectivation moment, is a recurring philosophical problematic. Derrida's "transindividual relation" is the "exterior reflexive fold of subjectivation" where similar to Simondon, the subject is not fixed but constantly being rewritten and reinterpreted, and is constituted by writing itself into exteriority through a self-touch relation (Derrida, 2005). The *self-touch* relation (seeing the self from an alterity) triggers subjectivation through *exscription* (the subject writing itself in exteriority). Heidegger's "transindividual relation" is *Geworfenheit*, the opening into which the "I" is thrown and must respond by subjectivating.

The Zarathustra moment is also the case of another recurring philosophical problematic of the subject experiencing moments of anxiety as a trigger for subjectivation. For Heidegger, the anxiety is the wake-up call from the conscious that forces one to choose whether to live authentically into one's own finitude. For Kierkegaard, dread is the motivation towards subjective truth, true faith, and existentially determining one's own way. For Bergson, it is discomfort and great crises that activate the possibility to exercise free will. For all of these philosophers including Simondon, anxiety-triggered subjectivation moments are rare. One great benefit of the CME is in catalysing more of these moments; however it must be queried how volitional these moments can or should be. How active can or should a subject be in triggering moments of subjectivation, especially when the subject is often an effect not a cause of the world process like individuation. Initially, it might seem that individuation cannot be volitional. It occurs through unforeseeable events that are provoked externally and "cannot lie in a voluntary decision by the subject" (Combes, 2013, p. 38). However, an answer can be inferred in that while individuals are effects of world processes, they are not passive but rather continuously ideating and resolving incompatibilization problems and therefore can

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try to catalyse subjectivation moments by being aware of how subjectivation happens and putting themselves into propitious situations. While these anxiety-triggered subjectivation moments have been rare, they need not be. CME technologies might be employed to effectuate all manner of anxiety-triggered subjectivation moments. Thus the role and position of the CME persists as a means of facilitating greater possibilities for individuation, catalysing more situations where individuation can be realised.

CME facilitates the individuation of the collective

For the full subjectivation of the individual, there must be not just "the collective individuation of the individual" but also the individual's participation in a collective since "the subject cannot coincide with himself even in the collective individuation, because the individuated and the preindividual cannot coincide directly" (Simondon, 1989b, p. 108). Thus "the final individuation cannot be done within the being of the subject; it can only be done through other beings, as a transindividual collective" (Simondon, 1989b, p. 213). The result is that the subject is not reducible to either the pure individual or the pure social (collective). Neither individual nor collective is privileged, what is most important is the relation between them in transindividual reality. As with the individuation of the individual, the CME can potentially facilitate the individuation of the collective in a number of important ways that were less possible before the CME. Three aspects of Simondon's collective individuation are explored: society as a dynamic and shifting set of relations, group formation and the collective structuration of emotion.

Society is a dynamic network of relations

Simondon's worldview of society is that it is a dynamic network of relations. The transindividual relation (the interplay between interiority and exteriority) provides a way of understanding both the individual and the relation between the individual and society. The traditional psychological and sociological approach is that the individual and society exist in an established relation as one term to another. However this is static and one-dimensional. Instead for Simondon, the relation is that of a reciprocal environment of exchanges of information and causality in the larger scope of a system that individuates. The ontological unit of precedence is the system. The world is a system that individuates groups and individuals where the individual is the effect of the individual individuation, and the group is the effect of the collective individuation.

Individuals are already linked through preindividual reality, and this is the precondition for the individuation of the group: "before structuring itself, the collective is already in subjects, in the form of parts of uneffectuated nature" (Combes, 2013, p. 51). Preindividual reality is inspired by the pre-Socratic notion of nature or *apeiron* (the undetermined, possibility, unindividuated preindividual potential). Individuals are connected in the collective initially by being connected through the undetermined. It is because of this shared potential that individuals can enter into relation with one another and constitute a collective. The individuation of the collective connects "the natures that are brought by individuals, but not contained in the already-constituted individualities of these individuals" (Simondon, 1989b, p. 197). If individuals were not already connected through preindividual potential, a collective could not individuate. "The collective has its own ontogenetic individuation utilising the potentials brought by the preindividual reality contained within beings" (Simondon, 1989b, p. 211). Thus the collective is a new and different linkage of preindividual potential across the social fabric of individuals: "the collective arises through the preindividual zone of subjects that remains uneffectuated by any functional relation between individuals" (Combes, 2013, p. 38). The collective individuation is the situation of the formation of a new group, one that goes beyond already-existing functional social relations between individuals, as Zarathustra's spectator to the ropewalker's performance artist.

Through the interplay between the interior and the exterior in the transindividual relation, the connection is not as one term to another but in the complexity of overlap where "the individual only enters into relationship with the social through the social" (Simondon, 2005, p. 295). Only by being already preconnected in the social or collective, through shared preindividual potential, are subjects able to enter into new social relationships. Importantly, in the social relation, "the interiority of the group is a certain dimension of the individual personality, and the social is a zone of participation around the

individual" (Simondon, 2005, p. 295). The individual is distinct from the social or the group, and the two are linked in a transindividual relation. The group's interior is constituted by parts of group member personalities. The group is exterior to the individual, existing as a zone of participation around individual group members.

Several aspects of the CME point to it as an enactment venue for the collective individuation as thus described. First, the preindividual potential of individuals is already connected in the sense that any human agent is potentially linked to all other humans through the CME. Second, the CME serves as the zone of social participation around individuals in which the collective individuation takes place. Third, both individuation and the CME focus on the key activity of participation. There is an expectation of participation in the CME, and a progression in the magnitude of digital collaboration, from sharing to cooperation to collective action (Shirky, 2009). The collective action-taking capacities afforded by the CME have been recently demonstrated in collective individuations in the cases of in global crisis response (Hui, 2013) and political action. CME social media allowed the coordination of Arab Spring, the Hong Kong university protests featuring real-time personalized drone footage, and the "*Je suis Charlie*" manifestations. What is new in the CME is that individuals are always-already situated in the global social through the connected world, and thus able to immediately participate in new collective individuations in real-time.

Group formation

Group formation is the next moment in Simondon's theory of collective individuation. Just as he rejects theories of individual subject formation for taking the subject as already formed, he rejects theories of the group and society from psychology and sociology for similarly taking the group as already formed. The concept of individuation instead focuses on how the individual subject and group arise. A group is not formed as "an assemblage of individuals" (Simondon, 1989b, p. 182), or per a sense of sociological belonging to a group entity. Instead, a group "is born when forces held within many individuals lead to a collective structuration" (Simondon, 1989b, p. 184). A group individuation is two simultaneous inseparable individuations: the individuation *of the entity that is the group* and an individuation *of individuals as grouped individuals*, where grouped individuals become "group individuals" (Simondon, 1989b, p. 185) or units for the collective (Simondon, 1992, p. 307).

The group is not founded by individuals with preexisting relations; rather the individuation brings about the collective: "it is the individuation of the collective that is the relation between individuated beings" (Simondon, 2005, p. 11). The collective is not a result of the relation; it is the relation that expresses the individuation of the collective. As with the individuation of the subject, the collective is an effect, not a cause, of the individuation process. As part of this relation, the individual is protected from being controlled by and absorbed into the group by only participating in the group with a part of itself; via a "certain dimension of the individual personality" that is the generation of a new personality. The group is constituted by "the superposition of individual personalities" (Simondon, 1989b, p. 182) whose genesis "is contemporaneous with the genesis of the group" (Simondon, 1989b, p.183). The individual participates in the group in a way that is constitutive of the group, and self and group individuate simultaneously.

The CME offers many more opportunities for group formation and collective individuation. Frictions like the cost of joining and participating are reduced, so there can be more activity. Humans want to like, join, participate, share and engage as a means of social belonging and self-actualization. The CME provides graduated ways to do this in comfortable funnels of engagement that progress from light to heavy, with escalated action-taking such as liking, subscribing, joining, participating, coordinating and leading. While other new challenges arise regarding valorization and selection, for example information overload and filter failure (Asay, 2009), the bigger point is the greatly-extended possibilities for collective individuation offered though the CME.

Role of emotion in individuation

Emotion is the trigger for both individual and collective individuations. In individual individuations, emotion as anxiety is the signal of self-world and exceeding-the-self incompatibilizations and Zarathustra

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moments. In collective individuations, emotion structures itself across multiple beings to effectuate group individuation. Emotion has a causal role in the individuation of the collective. Individuals are already connected in the collective through preindividual reality as a precondition for individuation, and then the actual operation of the group individuation happens through a structuring of emotion. The collective is born at the same time as an emotion structures itself across several subjects, and as such structuration of that emotion. Specifically, "emotion is the power to create an individuation of the collective that will discover and attach the individuated being; emotion prefigures the discovery of the collective" (Simondon, 1989b, p. 212). The structuring of emotion is the necessary genesis of the collective and the collective will only arise to the extent that an emotion structures itself across grouped individuals (Simondon, 1989b, p. 211).

Simondon's theory of emotional latency

Simondon affirms two senses of emotion, emotion in the familiar everyday sense, and emotion in the sense of the *emotional latency* that structures itself across individuals and effectuates the collective individuation. "Emotional latency is the onset of a new structuration that can only stabilize itself in the discovery of the collective" (Simondon, 1989b, p. 213). Emotional latency explains what happens in both *the collective individuation of the individual* and *the individuation of the collective* as there is a transindividual relation, a structuring of emotion between the inside and the outside. However, "action is the individuation of the collective grasped on the side of the collective, while emotion is the same individuation of the collective grasped on the side of the individual" (Simondon, 1989b, pp. 106-107). Action-taking is the externally-manifesting property of the collective.

Emotion, collective individuation, and the CME

There are several ways that the CME facilitates the process of emotional latency structuring itself across a group and producing collective individuation. One example is through music, where the CME can orchestrate individuals coming together in an experience that results in a collective individuation. Shared experience produces a collective structuration of emotion that then individuates a group, the group being those who have had that particular experience. Fig. 1 illustrates examples of individuals participating in CME-mediated collective individuations, an Electronic Dance Music (EDM) event, and a virtual choir. In the virtual choir, singers record and upload their videos which are synchronized and combined into a single performance.

Figure 1: Examples of Simondon's CME-facilitated Collective Individuation: Electronic Dance Music (EDM) event (Q-dance) and Eric Whitacre's Virtual Choir 3 "Water Night"

In EDM shows DJs use CME technologies to create immersive experiences specifically designed to evoke and progress audience emotions. Media theorists have cited EDM as a complete expression of the CME in creating fully technologically-designed and mediated experiences (Butler, 2006; Rief, 2009). These experiences are capable of transforming the environment and the life of the subject (Vitos, 2014),

meaning producing both individual and collective individuations. Another example of collective structuration is the possibility of sharing subjective experience in the CME, possibly through immersive headsets like the Oculus Rift and Microsoft's HoloLens. These CME technologies enable "you to feel like you are actually present in another place with other people," and thus share entire experiences and adventures with others (Zuckerberg, 2014). The distinction is not just sharing a picture of an experience afterwards, or in real-time as CME property Instagram allows, but actually participating in a live experience like a sports event with others present with you in digital reality. The great potential of the CME is in providing experiences that allow emotion to be structured quickly and effectively across individuals such that they become group individuals through the individuation of the collective.

CME facilitates individuation of the collective when technology is the Other

One key feature of the CME is that technology, data and information are the full-fledged other in many and perhaps most of human interactions ranging from the slightest information-obtaining to the deepest level of meaning-making. Since technology is the other, and collective individuation is crucial for subjectivation, there could be collective individuations where the collective is comprised of both humans and technology entities as group members. Simondon clarifies that individuation is not privileged to human subjects but applies to all living beings. Machine entities could be said to be sufficiently "living" for the purposes of collective individuation in the sense that they have some degree of agency, autonomy and proactive interaction with humans. Here, individuation can be seen as the possibility for any agent to realize its potentiality for growth and actualization. Thus human and machine entities may be individuating, co-individuating, and participating in collective individuations in a wide possibility space or capacity spectrum for individuation.

Capacity-driven subjectivation

Simondon sees entities as existing on a spectrum of capacity for individuation, where their difference is one "of level rather than nature" (Simondon, 2005, p. 272). The notion of a spectrum accommodates many different kinds of entities within the same paradigm. Existing and future versions of humans and technology entities could be mapped onto the continuum per the same parameter of differing by degree (like temperature) not nature (like form). Entities subjectivate based on their capacity to do so, not their underlying morphology, since "what defines a domain of being are not the substances filling it, but the distinctions born of individuation" (Combes, 2013, p. 28). All entities thus exist on a spectrum of different degrees of capacity for different kinds of action-taking. Thus entities are seen in terms of degrees of capability, which is dynamic potentiality, instead of as fixed quantities, which is rigid and static. This is an extremely empowering anti-essentialist, anti-determinist view of subjectivation. Morphology does not predetermine, limit or govern the possibilities of an organism. Thinking in terms of capacity instead of morphology affirmatively orients the view towards the open-ended consideration of new possibilities for being and action in the world, as opposed to the circumscribed, finite and fixed possibilities defined by morphological classification.

One implication is that the basis for the relation between entities is also not related to underlying morphology, but rather capacity for individuation. This suggests exciting upside possibilities for individual and collective growth given the right stimulus and resources. Further, Simondon's consistent themes of dynamism and process are present here too, as any placement on a capacity spectrum is only metastable or ephemeral, based on the present snapshot moment of individuation which is always expanding. A capacity-driven view of subjectivation thus implies mobility and the ability for entities to grow and individuate even more given resource availability. External factors like stimulus and resources as opposed to internal factors like morphology become the constraint on subjectivation. Just as intelligence is conceived as a raw quality that can be enabled with education, so too can the capacity for any entity's individuation be mobilized.

Capacity-based theories of subjectivation are espoused by Simondon, and also Spinoza (an influential thinker for Simondon), and Bergson. For Spinoza, the subject is defined on the basis of "power of action," which is the capacity to affect others and to be affected by others. For Bergson, perception is the subject's

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capacity for action. Also like Simondon, Spinoza is concerned with the collective, acknowledging the Hobbesian necessity of man living in societies, but seeking ways for man to feel freer doing so. Spinoza aims at what might be considered a prototype of Simondon's collective individuation (and Deleuze and Guattari's *desiring-production*) in claiming that humans can live together most productively by expressing rather than subjugating their true desires, that "men will be most useful one to another when each seeks most that which is useful to him" (Spinoza, 1677). For Simondon, Spinoza, and Bergson, the subject is dynamically situated on a spectrum of capacity for individuation, affect, or power of action.

Human-machine CME capacity spectrum for co-actualization

As a model, the capacity spectrum is a flexible structure that could include and productively organize the conceptualization and execution of many types of endeavour, especially between diverse entities. A capacity spectrum is not just for individuation, but for the realization of any sort of capacity. For example, compassion, empathy, magnanimity, creativity and ideation could all be mapped onto capacity spectra as a simple organising parameter (Swan, 2014a). Further, the notion of a capacity spectrum could be extended from just being a continuum to a full 2-dimensional plane or 3-dimensional volume of possibility space as a way to visualize the different individuation capabilities of diverse entities within the same framework.

A capacity spectrum is helpful because it is a framework that does not highlight morphological differences but rather aligns entities on the same ground and value system for their most important forward-looking shared parameters, like growth and actualization. The higher-order objective is the ability to individuate; to learn, grow, and contribute more, for both human and technology entities, and the two in symbiosis and synthesis. In addition, the capacity spectrum is not just a current mode of mapping and interaction among diverse entities, but also a mechanism for the successful transition to different and uncertain futures. This is important as technology advances, or individuates, at much higher rates than biological humans. Productive interaction between intelligent species could be fostered through the notion of their being joined in the common framework of a capacity spectrum for mutual growth in digital society (Swan, 2015e).

The limitations of Simondon's individuation

There could be many potential limitations and critiques of both Simondon's theory of individuation, and the way it has been employed here, in the claim that the CME facilitates the greater possibility for individuation. One is that there is an overreliance on emotion and an external other in individuation. However, it might be possible to fulfil the same functionality with alternative mechanisms. Emotion and the collective have been the convenient factors that have been involved in individuation, but they may not be required (Swan, 2014a). CME technologies might bring better, quicker, more objective and action-oriented information to individuals to replace or supplement the reliance on emotion and the collective as other. In fact, the current dependencies may actually limit the possibilities for the individual's subjectivation since individuation is limited to propitious moments. Instead these moments might be catalysed in many other ways by the CME's ability to structure emotion and produce exteriority and alterity.

A second potential limitation is the possibility that the CME infantilizes humans rather than helping them to advance. The argument is that the automation economy displaces humans into irrelevancy (Carr, 2014). Indeed, the immediate reaction to the CME could be that man's agency is being usurped. Humans appear coddled into passivity and overly-dependent upon technology; no longer able to think for themselves with the CME automatically piloting all aspects of daily life. However, what is happening at a higher level is that large classes of time-occupying tasks are being removed from human purview and pushed into realization via technology. What this means is not infantilization, but the continued trend of technology making life easier, not just in mechanical tasks (as the role of technology was previously conceived), but now importantly in cognitive tasks too. Thus human effort might be deployed towards more complex and rewarding activities involving creativity, invention, ideation and problem-solving. The CME should be seen as a tool for both mechanical task relief and cognitive processing offload, and mental offload not just for lower-level tasks like obtaining information, but increasingly for cognitively-relevant tasks like planning and coordination.

Conclusion

The CME can potentially facilitate individuation in ways that were previously impossible. The purpose of the CME can be seen as to uplevel existence, to allow humans to engage with themselves and the world in new ways that produce growth, actualization and individuation. The CME might be able to help with greater activation of individuation, both the individuation of the individual, and the individuation of the collective, and also now the individuation of the collective with machine others as group members. In the individual individuation, CME technologies might help facilitate the three types of individuation, anxiety-driven individuations through self-world and exceeding-the-self incompatibilizations, and Zarathustra moments of disindividuating individuation. Likewise in the collective individuation, CME technologies might help facilitate the structuring of emotion or other input signals across a group that then causes its individuation. Also in the case of human-technology individuations, the CME is the venue, facilitating mechanism and mediator of such individuations. Overall the CME allows much greater possibility for all forms of individuation.

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