
Human Fluid Dynamics

Exploring the Collective and Individual Aspects of Movements and Crowds

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Crowds of people are systems that share characteristics with fluids. Both flow in response to external forces and are defined as a collective manifestation of the complex internal behaviour of individual elements. In the realm of social movements, the analogy of fluid dynamics offers a captivating lens through which we can examine the dynamics between individuals and the collective, and the transformative potential of movements. As we ponder the fluidity of human gatherings, a chorus of questions arises, unveiling the intricate interplay of internal connections, external power structures, and profound transformation.

The Individual Flow: Each Person as a Particle

On an individual level, each person within the movement can be likened to a particle in the fluid analogy. They possess their own unique qualities, strengths, and perspectives, much like the molecules that make up a fluid.

Just as the properties of a fluid determine its behaviour, the diverse attributes of individuals shape the nature and direction of the movement. Often these individuals or groups come together because they were moved emotionally and want to express these emotions, voice their grievances, and advocate for specific causes or social change.

They may face the internal struggle of differentiating themselves from the broader ideology while continuing to move forward. A trade-off might arise which expresses itself as follows: broadening the stream slows down the flow rate and thus the progress, while embracing a more narrow view that doesn't align entirely with their own beliefs could facilitate faster flow, but when it is to narrow the consequences might become destructive. It is a delicate balance between maintaining their individuality without slowing down the flow and therefore becoming invisible once again.

When does flow become destructive? How to differentiate yourself from the bigger ideology while still moving forward? Can we mix spontaneously or do we need hydraulic control?

The Collective Flow: Movement as a Continuum

The collective flow is a means for the individual to be seen and heard; it transcends the boundaries of the self while also amplifying their impact, as their influence extends far beyond their immediate sphere.

They can take various forms, including marches, parades, rallies, sit-ins, pickets, or strikes. Protests serve as a means for people to exercise their right to freedom of expression and to collectively demand transformations. A movement strives for progress in some particular direction, and can evolve over time, gaining momentum and attracting support from diverse individuals and organizations. In addition many other different flows of people can be observed. For example migration, panicking fleeing crowds, dancing at festival, or Pilgrim routes such as Camino de Santiago.

Cautions of the continuum analogy

However, Marc Bernardot warns against dehumanizing of human flow by solely portraying it as a (whole) fluid. This approach overlooks the power differentials between the subjects and external viewers, erasing individual agency and histories. Language employed by power structures, such as the European Commission, further exemplifies this issue, using phrases like "sea of humanity," "wave of migration," or "channelling and stemming irregular flows" about refugees. By focusing solely on the flow as an external observer, critical information about the process and the perspectives of the individuals is missed. This corresponds to how external observers start to moral distancing a movement: failing to see members as individuals, and failing to see diversity within that. One should move away from portraying individuals as an ever-moving and undifferentiated mass. To fully understand movements, we must move beyond simplistic metaphors and strive for a nuanced understanding, looking both from within and from above.

Can we characterize these flows of people in a way we would measure and characterize flows of fluid and then from the external motion and behaviour of the crowd, deduce the impact and social-emotional energy that it carries?

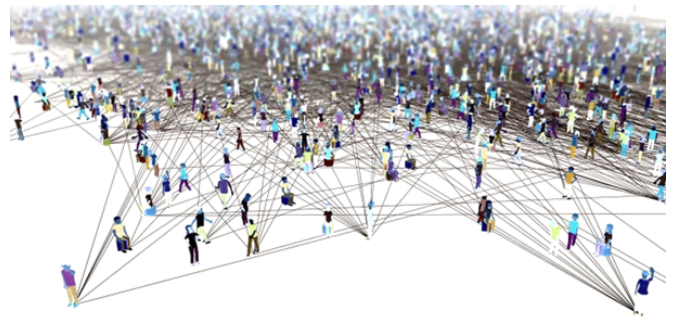


Figure 1: Connections within a crowd. Image credits: Christoph Burgstedt/ science photo library

Interconnectedness: The Continuum and the Particle

Inspired by Stephen Hawking's framework of physics bounding dynamics, boundary conditions, and observership together into one, we want to (re)visualize the human flow including the particle perspective. To quote professor Thomas Hertog "We create the universe as much as the universe creates us." Or in our case, we create the movement as much as the movement creates us.

Even though the power of the crowd is that it behaves as a collective, the impact of each individual and the interaction between individuals is important. The interconnectedness highlights how the impact of each person extends beyond themselves and influences the collective movement.

Each person's thoughts, emotions, and actions contribute to the overall dynamics, creating a ripple effect throughout the flow. Moreover, the interactions between individuals within the crowd become channels for the exchange of ideas, perspectives, and experiences. The contagiousness spreads not only through direct

contact but also through observation and empathy. As individuals witness the passion and conviction of their peers, they are encouraged to join in, align their actions, and contribute to the collective movement. Each person's engagement and commitment are vital, as they have the power to ignite change and inspire others. The contagiousness of the crowd, driven by the connectedness and interdependence of its members, creates a dynamic environment where ideas flourish, resilience grows, and transformative actions take shape.

When presented with the information of the collective flow they are part of, can it influence people to think about their individual impact and drive them to move (differently)? Is there a purpose/ direction in the fluid dynamics, what are the internal structures and what is the impact of randomness?

In the context of Human Fluid Dynamics we want to expand the vocabulary used to describe masses that give more notions about the state of the particles themselves. Drawing inspiration from the realm of physics, we can enrich our understanding by incorporating various parameters that express the unique characteristics of the human flow, similar to how physics employs parameters to describe fluid behaviour. Just as heat capacity measures the ability of a fluid to store and release energy, we can explore the resilience and collective strength exhibited by individuals in a movement. Laminar flow and turbulence, often associated with the smooth or chaotic motion of fluids, can be translated metaphorically to describe the harmony or disruption within a movement. Compressibility can reflect the flexibility and adaptability of individuals to changing circumstances and challenges they encounter. viscosity allows us to consider the friction and resistance encountered by individuals within a movement, highlighting the various forces that impede or facilitate their progress. Refractive index, typically associated with the bending of light in a fluid, can symbolize the shifting perspectives and diverse interpretations within a movement, acknowledging the multitude of voices and viewpoints. Vorticity can capture the swirling

dynamics of ideas and actions within its core. By embracing these and other parameters, we can construct a multidimensional understanding of movements, offering insights into their agency, evolution, energy, diversity, and potential.

These parameters aim to enhance our understanding of movements, shedding light on the intricate interplay of individuals, their motivations, and the collective forces that shape their journey. To move away from oversimplifications and generalisations, and become more empathetic towards each other, fostering a richer and more nuanced understanding. Such an approach allows us to capture the essence of these endeavours, empowering us to analyse, interpret, and appreciate the impact they have on society and individuals alike.

Flow analysis of the Unthinkable experiment

To revisualize human flow by incorporating the perspective of the individual, the key is to strike a balance between the collective representation and the individual perspective. By incorporating elements that highlight the agency, experiences, and unique contributions of individuals within the human flow, an image can be created that offers a more nuanced and inclusive understanding of the movement. We can get inspired by the projects of the other participants of the Unthinkable Experiment.

The silent motions – Emily Guido

Emilys artwork incorporates personal narratives alongside the visual representation of the human flow, in this case migration. These narratives highlight individual experiences, motivations, and challenges within their broader movement. By including personal perspectives, the visual representation becomes more relatable and empathetic, allowing viewers to connect with the individuals behind the flow. Emily her work also shows the generational consequences individuals of a migration flow have experienced.

Jason & Maxim

Jason and Maxim's work underscores the dynamic nature of language, emphasizing how its meaning is in perpetual flux, contingent upon context. It underscores the fallibility of relying solely on labels, revealing the potential for deception they carry. Unlike the continuous nature of mathematics, language often confines us within discrete and limiting structures. There is a uniqueness in individuals and situations that labels cannot capture. Paradoxically however, labels also serve as indispensable tools for our comprehension of the world. The parameters of the crowd invites viewers to transcend the confines of usual stereotypes and labels. This task is difficult; demanding deliberate effort, introspection, and reflection. Awareness of the impossibility of achieving complete understanding is fundamental; as this very acknowledgment might serve as a first step towards empathy.

We invite you to look and discover the collective flows as well as the individual stories and connections in the other works of The Unthinkable experiment.

Koen Vanmechelen

"In verbinding met de ander, ontdek je jezelf."
In connection with others, you discover yourself.