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Title: High Speed Trading Algorithms and Human Manipulations—Agency and Accountability in Complex Financial Markets

Abstract: Scholars such as Crawford and Hayles have examined the role that algorithms play in financial markets, and argue it is no longer possible to understand “the global economy without taking into account the ‘self-organizing ecology of ultrafast machine algorithms,’” (Karppi and Crawford, 2015: 2). I take an ecological approach to examine how the interaction of human and nonhuman actors in these markets requires a more distributed notion of agency, which disrupts our linear understanding of causality with consequences for determining accountability or responsibility in market events. I discuss the emergent cooperation of high-speed trading (HST) algorithms, and juxtapose it against examples of human-driven market manipulation, to trouble the connects between between agency, accountability, and regulation. Although created by humans, HST algorithms work together in potentially emergent ways generating unintended changes in the market. Such changes are often at the “millisecond-scale” resulting in “ultrafast extreme events,” but these events also coalesce into and around larger events like the Flash Crash in May 2010 (Johnson, et al, 2013).

In considering regulatory strategies for dealing with the emergent and unpredictable impacts of HST algorithms, I argue that we need to take seriously the agency of these algorithms. This understanding of algorithms, that they are agents enmeshed in vibrant assemblages at multiple simultaneous spacetimes, is here used to analyze the 2010 Flash Crash because one of the most troubling aspects of this event in terms of accountability is in understanding how the Crash unfolded and interacted across different timescales or spacetimes. Thus in considering whether or not a policy like “speed bumps” will be effective in regulating financial markets, we must also ask ourselves how such policies would function in these self-organizing ecologies at faster than human timescales.

In conclusion, this paper, by closely examining the May 2010 Flash Crash, sheds new light on the developing field of study on high-speed trading algorithms and their role in global financial markets by looking at the agency of the algorithms involved and how that agency complicates questions of regulation and accountability.

References:

Johnson N, Zhao G, Hunsader E, Qi H, Johnson N, Meng J, and Tivnan B (2013) Abrupt rise of new machine ecology beyond human response time. *Scientific Reports* 3, Article number: 2627.

Karppi T and Crawford K (2015) Social media, Financial Algorithms, and the Hack Crash. *Theory Culture and Society*, published online before print May 4, 2015.