

## Projects as Complex Systems: A Network Perspective

Wednesday, 18<sup>th</sup> May 2016 12:30 p.m.

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### Webinar Overview

Complexity is often cited as an independent variable that challenges the utility of traditional project management tools and techniques. A large body of work has been devoted in exposing its numerous aspects, yet means for quantitatively assessing it have been scarce. Part of the challenge lies in the absence of hard evidence supporting the hypothesis that projects can be considered as complex systems, where techniques for measuring complexity and its implications are better established. Working towards clarifying this hypothesis, I will: (a) present evidence from a comparative study that sheds lights into the relationship between engineering projects and complex systems; and (b) present a framework for quantifying an aspect of project complexity using readily-available data. Shifting focus to the implications of this relationship, I will: (c) introduce a model to assess the probability of a failure cascade to impact a project, where a failure cascade is defined as the number of tasks affected by the failure of a single task. Insight from this model indicate that: (i) large failure cascades can occur for the exact same reason as small ones do, and hence, challenge narrative-based explanations for project failure; (ii) the likelihood for large failure cascades to take place is much higher than anticipated, and (iii) local mitigation action, in the form of increased resource efficiency, is both ineffective and insufficient in containing such failures. Finally, I will provide a brief overview of current work and discuss future research directions.

### Presenter

Christos Ellinas is a graduate of Civil engineering from University of Bath, UK (2012). After completing his Master's thesis in the area of contractual risk, he joined the Engineering Doctorate programme at the Systems IDC, University of Bristol, UK. In collaboration with Systemic Consult Ltd, he is currently undertaking an EngD in Systems Engineering, focusing at the intersection of complex networks and risk management, across a variety of domains. His research has been featured in top-tier academic conferences – including a keynote speech in Governance, Risk and Compliance 2016 – journals and industry-focused guides, including the Institute of Risk Management's "Extended Enterprise: Managing Risk in Complex 21st Century Organisations". He is actively engaged in broadening the reach of academic research by contributing non-technical publications, with the latest focusing on systemic failures across the UK insurance domain (<http://www.solvencyiiwire.com/the-surprising-systemic-risk-of-insurers/1585676>). Christos was the finalist for the Association of Engineering Doctorate's "Research Writer of the Year 2013" and the Fraser-Nash's "Best Paper Award 2014". His recent work has been awarded the Actuarial Foundation's "ERM Research Excellence Award 2015". He is a student member of INCOSE.

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