

# Unconventional Proving Techniques in Cyber – Physical Systems

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## Abstract

Cyber - Physical Systems [CPS] are “Engineered systems that are built from, and depend upon, the seamless integration of computational algorithms and physical components”. CPS have the potential to provide much richer functionality - including efficiency, flexibility, autonomy, and reliability – than systems that are loosely coupled, discrete, or manually operated. CPS also can create vulnerability related to protection, security and reliability. This can result in a chaotic collapse around the many new complex and powerful technological systems we rely on. The very complexity and interconnectedness of such CPS warrants unconventional proofing to unravel. Moreover, CPS is diffused across the social fabric. The sociology of mathematics is quite elusive for the construction of formal proofing in CPS.

The gap between rigorous argument and formal proof in the sense of mathematical logic is one that will close in CPS.

The generic characteristics of CPS are: