

### A Theory of Verification and Validation: Research Gaps and Challenges

#### SEMINAR SESSION INFORMATION

**DATE:** Wednesday, Sep. 21<sup>st</sup>

**TIME:** 12:15pm

**LOCATION:** Whittemore 542

**PROVIDED:** Pizza and Soda

#### SPEAKER INFORMATION

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#### MEMBERSHIP INFORMATION

Fees are as follows and include all weekly seminars (22+) & workshops.

**FIRST MEETING: FREE**

**MEETING: \$5**

**SEMESTER: \$25**

**YEAR: \$40**

Verification and validation activities provide the evidence of contractual fulfillment in the development of large-scale systems. Thus, the importance of adequately defining verification and validation activities in any acquisition program is unquestionable. Its significance extends beyond contracting though. The biggest portion of the development financial budget is spent in executing verification activities and verification activities are the main vehicle in discovering knowledge about the system, which is key to reduce development risk. In current practice, the definition of verification strategies is driven by industry standards and subject matter expert assessment. This approach leads to four major risks. First, there is a high uncertainty associated to the optimality of the selected verification strategy in terms of mitigated risk with respect to verification cost. Second, there is a lack of a quantitative risk measurement associated to chosen verification strategy, which jeopardizes any mindful effort to execute informed trade-offs regarding execution of verification activities. Third, there is a high risk associated to the verification coverage of the selected verification strategy, which threatens the successful integration of components and the successful operation of the system. And fourth, there is a lack of alignment between stakeholder objectives and verification strategy, which leads to suboptimal decisions regarding the execution of verification activities. A theory of verification and validation could help mitigate these problems. This seminar will present a roadmap to develop such a theory, together with existing research gaps and challenges to succeed in such endeavor.