Title: **Requirements-Driven Design from Concept to Implementation to Compliance**

Abstract:
As electronic design complexities escalate and the ramifications of project failure become more severe, the need for new design techniques becomes more critical. New design techniques are needed not only to describe these designs, but to aid in verification, reusability, reliability, agility and management, while also reducing project risk. Applying a requirements-driven design approach, which is being rapidly adopted for projects with compliance needs such as DO-254, ensures that the verified design performs its intended function before costly commitment to silicon.

A requirements-driven design approach is beneficial to any design project and vital to all safety/mission/security critical projects as the process will improve efficiency, productivity, quality, and project schedule predictability. However, raising the level of design abstraction above RTL will contribute an entire new dimension of benefits to this design approach. Raising the design description language up from RTL to electronic system level (ESL), which is TLM-based (transaction level modeling), will enable more design to designed, explored, validated, and co-designed with corresponding software and firmware to result in faster design cycles and higher quality projects.

Automating the traceability and management of the design requirements from the original requirements source through all these levels of design and corresponding verification results provides status at any stage and delivers project visibility as never before, enabling the design team to make informed decisions and adjustments to keep the project on schedule. As this paper will discuss a requirements-driven design process in terms of SoC design, the approach and concepts are applicable to all design – it's just good design practice!