



# INCOSE Healthcare WG

## May 25, 2017 Webinar



### **Topic: Model-based Design of Artificial Pancreas Algorithm Software**

### **Presenter: Lou Linteur, Systems Engineering Medtronic Diabetes Intensive Insulin Management Business Unit**

The closed loop artificial pancreas algorithm in the MiniMed 670G system is among the most complex yet developed at Medtronic Diabetes. Traditional software specification and development processes are ill-suited for such complex algorithms and may result in undesirable development costs and protracted schedules.

Other industries that develop highly complex algorithms for their products, such as aerospace and automotive, have adopted Model-Based Design (MBD) methodologies to reduce software development time and costs. MBD allows designers to express algorithms in the most suitable domain-specific language and utilizes system simulation throughout the development process to ensure designs are meeting requirements. The resulting algorithm models become executable designs from which embedded C code can be automatically generated for product application software.

This methodology improves development efficiency by separating design and implementation concerns, allowing algorithm engineers to focus on desired functionality and software engineers to focus on software integration. Generating embedded code directly from software models dramatically reduces code development time and eliminates human coding errors. It also fosters continuous software optimization as algorithms can be prototyped, coded, integrated and tested in rapid development cycles.

#### **About Our Speaker**

Lou Linteur is a Distinguished Engineer and Technical Fellow in the Medtronic Diabetes Group, Intensive Insulin Management Business Unit. He is the Lead Systems Integrator on the 670G program and has general responsibility for the engineering of Medtronic's closed loop insulin delivery systems. Lou joined Medtronic in 2011 as a senior principal engineer on the technical team that developed the predictive low glucose management algorithm for the 640G product. Prior to Medtronic, he was an engineer at Advanced Bionics, NASA Armstrong Flight Research Center and Hughes Space and Communications. Lou holds a B.S. in Aerospace Engineering from Purdue University and an M.S. in Aerospace Engineering from the Massachusetts Institute of Technology, with an emphasis in systems and control theory.

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