

#### Abstract:

A closed-loop control system may have unsatisfactory performance or even instability when faults occur in actuators, sensors or other process components. Fault-tolerant control (FTC) involves the development and design of special controllers that are capable of tolerating the faults whilst still maintaining desirable and robust performance and stability properties. The talk will outline the main ideas and concepts in FTC design with an emphasis on the requirement (a) To develop the FTC system at the commencement of the overall system or plant development, this refers to the idea of “co-design” (b) The need to involve methods of hardware and/or analytical redundancy of system function as far as possible i.e. can the system measurements be duplicated perhaps with dissimilar technology or can the control systems be replicated in duplicate form? The importance of considering FTC as “Digital Twin” problem will be introduced. Examples will be outlined from various areas of engineering, including from Mining/Metals.