

**Job Description: “Post Doctoral Fellow (PDF): Medical Cyber-Physical Systems Specialist”**

Certifying cyber-physical systems for safety, security, and reliability is a challenging problem that requires a combination of techniques and methods – more effective techniques and methods than are in use now will become essential. In a project funded by the IBM Canada Research & Development Centre, in collaboration with researchers at McMaster University, we are focusing our attention on medical devices and on the necessary elements that a documentation template for developing these systems ought to include. As a PDF working on this project you will explore sound techniques for developing and documenting a safe, secure, reliable insulin pump, and use this example to identify the essential elements of such a template. The expected work also will involve designing a certification process for medical devices.

The ideal candidate must be able to combine a set of software engineering, hardware, medical, and security skills to enhance our knowledge of building dependable cyber-physical medical systems.

Eligible candidates must have a broad set of skills, including:

- Experience in formally specifying software and hardware systems.
- Experience in designing, documenting, and assessing software systems.
- An understanding of current issues in system security.
- An understanding of current issues in co-design.

**Required:**

- Ph.D. in Software Engineering or Computer Science, or in a related area.
- Strong communications skills.

**Preferred:**

- Engineering background.
- Experience in leading a (small) team of people.
- Knowledge of FPGA environments.

**Job Responsibilities:**

- Help the investigators at McMaster University lead the discussion on building a template for the development of safe, secure and reliable insulin pumps.
- Primary responsibility for designing the template and the certification process for medical devices.
- Work with research partners to gather the requirements for a generic insulin pump.
- Propose an appropriate template for documenting the insulin pump software and hardware, and use it to document the insulin pump software.
- Propose a certification process for medical devices of the same class as insulin pumps.
- Design and develop prototype support tools.
- Evaluate, and potentially port, the support tools to an FPGA platform.

**Work Location:**

McMaster University, Hamilton, Ontario.

**Term of Contract:**

2 years.