

Specifying and Analyzing Workflows for Automated Identification and Data Capture

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Humans use computers to carry out tasks that neither is able to do easily alone: humans provide eyes, hands, and judgment while computers provide computation, networking, and storage. This symbiosis is especially evident in workflows where humans identify objects using bar codes or RFID tags and capture data about them for the computer. This Automated Identification and Data Capture (AIDC) is increasingly important in areas such as inventory systems and health care. Humans involved in AIDC follow simple rules and rely on the computer to catch mistakes; in complex situations this reliance can lead to mismatches between human workflows and system programming. In this talk we explore the design, implementation and formal modeling of AIDC for vital signs measurements in hospitals. To this end we describe the design of a wireless mobile medical mediator device that mediates between identifications, measurements, and updates of Electronic Health Records (EHRs). We implement this as a system Med2 that uses PDAs equipped with Bluetooth, WiFi, and RFID wireless capabilities. Using Communicating Sequential Processes (CSP) we jointly specify workflow and computer system operations and provide a formal analysis of the protections the system provides for user errors.