Gauging safety in the electronic age

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Engineers at the University of Leicester are taking the unusual step of learning from architecture in order to design safer electrical systems.

A doctoral project by Pakistani student Farah Lakhani is examining the development of software for embedded processors ("silicon chips") that are integral to products ranging from computer consoles to dishwashers and cars.

Her project focuses on the fact that the huge growth in demand for embedded systems, and the great increases in their complexity, means that engineers need new ways to create such systems. Preliminary results from the study will be showcased at the University of Leicester's Festival of Postgraduate Research on 24 June.

Ms Lakhani said: "One can imagine the difficulties of life without having all the electronic devices they are used in our daily lives. These devices have got a huge market and there are around 400, 000 people involved, around the world, in the development of software for such systems.

"Creating computer software for such systems is challenging. Research in the Embedded Systems Laboratory at the University of Leicester is aimed at making these systems more safe and reliable.

"The huge growth in demand for these systems (and the great increases in their complexity) means that we need new ways to create such systems. This is important not just to meet the needs of businesses, but

also because we rely for our safety on many embedded designs in systems such as cars, aircraft and medical equipment."

To help improve the reliability of embedded systems, Ms Lakhani's project is taking the unusual step of learning from techniques developed in the field of architecture. She said: "At first there may seem to be little in common between the designs of buildings and the design of control systems for, say, cars. However, architects must couple knowledge of engineering - for example what type of steel girder is required to support a floor -with human-centred design i.e. what makes a building a good place to live or work.

"Developers of embedded software must link similar concerns. The particular focus of my presentation is to consider how techniques called "design patterns" from the field of architecture can be used by developers of reliable embedded systems."

Provided by University of Leicester

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