



INFORMATION, COMMUNICATION & COMPUTING

Fields of Expertise TU Graz

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Source: Lunghammer – TU Graz

The measures regarding the novel Coronavirus have forced a shift in human life from the real world to the virtual world and the internet. This triggered an unprecedented push to the adoption of digitalization: school and university classes are taught online,

cultural institutions stream programs over the internet, meetings are held online, decision-making bodies such as our Senate are adopting their regulations to enable easier online decision-making, smartphone tracking and big data analytics are being considered or already used to monitor human activity and compliance to lockdown rules, digital fabrication of parts for low-cost ventilators should improve medical treatment, robotics is used to speed up processing of COVID-19 tests in the lab. I am curious about how much of this is here to stay after the return to a normal (physical) life and how it will change our lives also in the long run.

Electronics-based systems – the topic of this edition of TU Graz research – form

one foundation for this digitalization and Graz is turning into an international hot-spot in this regard with the establishment of the Silicon Austria Labs (SAL) on the campus of TU Graz. Recently, collaboration formats between SAL and the University have kicked off, including the establishment of two so-called TU Graz-SAL Research Labs where SAL researchers and TU Graz researchers are jointly investigating basic research questions in two areas: Dependable Embedded Systems and Electromagnetic Compatibility. Bernhard Aichernig (Computer Science) and Bernd Deutschmann (Electrical Engineering) report about these topics in this edition of TU Graz research. Enjoy reading!

Bernd Deutschmann:

Electromagnetic Compatibility of Electronics Based Systems Affects Us All

In recent decades, semiconductor technologies have been shrinking, while the operating frequencies and integration density of modern integrated circuits (ICs) have increased significantly. As a result, the electromagnetic emission (EME) of modern ICs and their electromagnetic susceptibility (EMS) have become a major issue in the design of electronics-based systems (EBS). In this context, engineers are increasingly required to ensure that their developed products function satisfactorily in their electromagnetic environment, i.e. that they are not functionally affected by electromagnetic interferences, but also that they do not negatively influence other devices through their electromagnetic emission.

But before we get into that, we should think about why electromagnetic compatibility of electronic devices and systems concerns us all and why this topic should be important for everyone. If the video that we are watching on our tablet gets stuck due to an electrostatic discharge that occurs as our fingers approach the tablet, it is annoying in most cases, but usually not life-threatening.

However, the situation might be different when electromagnetic interference occurs during the operation of avionics,

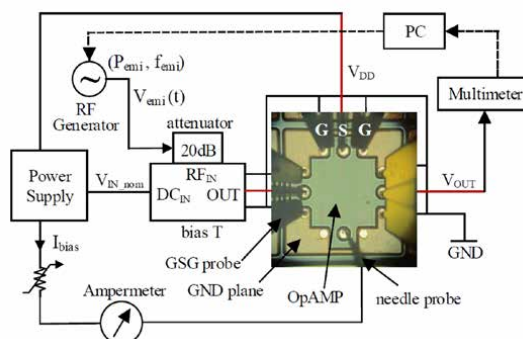


Figure 1: Example of a DPI test bench used to characterize the susceptibility of an operational amplifier.

Source: Andrea Lavarda [3]