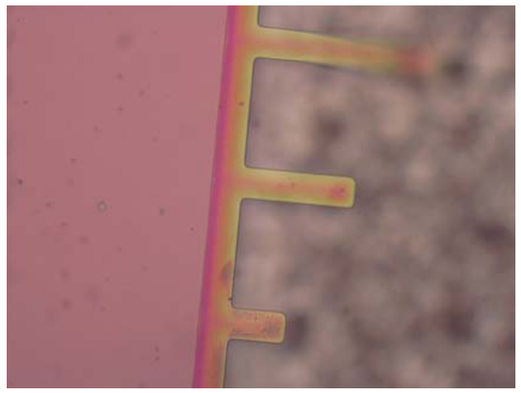
The Electronic Instrumentation Laboratory is proud to present its first

EI Colloquium

Chung Yang:
Cantilever Scaling

A cantilever is a beam that is clamped at one end. Because of its simplicity, it is one of the most often used MEMS structures. Micro-cantilevers can be used to sense many parameters e.g. force, mass, temperature and flow. Yet as technology improves and sensor demands grow, there is a growing interest in even smaller structures. Such nano-cantilevers result in high performance sensors, but also involve major engineering challenges. Over the past 5 years, I've been studying cantilever scaling, and challenging these challenges. During my presentation, I will give an overview of cantilever sensing, and discuss the results of my research. Some of these, I am proud to say, have advanced the state-of-the-art in this field.

Apart from presenting exciting scientific results, I'll be experimenting with Prezi, a free-ware presentation package. By doing so, I hope to inspire the use of new and creative presentation styles, by moving out of the PowerPoint box.

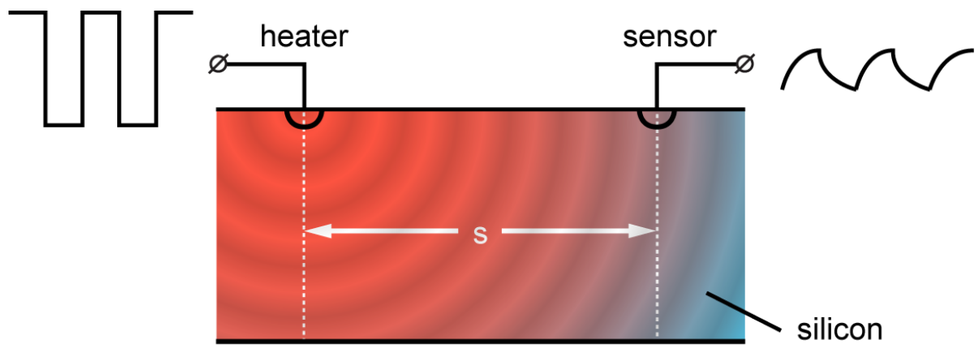


Caspar van Vroonhoven:
CMOS Temperature Sensors based on Thermal Diffusion

This work presents an overview of recent research into integrated temperature sensors based on the thermal diffusivity of IC-grade silicon. This has a well-defined temperature dependence and is insensitive to process spread and so is an interesting alternative to conventional temperature sensing techniques.

Thermal diffusivity can be sensed by measuring the time it takes for heat to diffuse over a fixed distance (s) in a silicon chip. The chip behaves like a thermal low-pass filter, whose phase shift is dependent on absolute temperature. The phase shift can be digitized by a phase-domain sigma-delta ADC.

The first prototypes were realized in a 0.7µm CMOS technology. They achieve an inaccuracy of ±0.6ºC (3σ) from -55ºC to 125ºC. Their accuracy was found to be limited by errors in the lithographic steps used to define the distance s. A second generation of devices uses the improved lithography of a 0.18µm CMOS process, reducing the error to ±0.2ºC (3σ) over the same temperature range.



Location:
Snijderzaal

Date & Time:
September 2nd, 16:00 - 17:00

Afterwards:
Drinks & Pizza!