Meet Dr Guangbin Dou

Dr Guangbin Dou is a Microsystems scientist with extensive research experience and a track record of research excellence in device fabrication, integration and packaging.

Can you explain your research field and current interests?

My research interests lie in the application of electronics packaging and microfabrication technologies to the development of Microsystems. These technologies currently include laser-assisted packaging for plastic electronics manufacturing and MEMS (micro-electro-mechanical systems) fabrication for applications requiring extreme reliability. Working with Professor Andrew Holmes in the Optical and Semiconductor Group at Imperial College London, I am currently the investigator and researcher on the CIMLAE-funded ITAPPE project. I believe I am working in a very important area that could lead to smart integration of low cost plastic electronics for the future Internet of Things (IoT) – a practical application developed from my previous research into novel low temperature and fine-pitch integration technologies.

What is the ITAPPE project working towards, and how could that affect me as an end user?

In the ITAPPE project, we are developing low cost, reliable interconnection techniques for large-area plastic electronics manufacturing. These techniques can build mechanical and electrical connections between individual plastic or silicon devices and plastic electronic circuits to form functional large-area hybrid electronic systems, for example smart labels that allow houseplants to 'ask for water' and bottled milk that can let you know when it has reached its use-by date. This is exciting because ITAPPE could provide innovative bonding techniques for large scale manufacturing of plastic electronics that have the potential to improve our life experience through the new concept of IoT.

What has influenced the project's progress so far?

In the last year, the big challenge in ITAPPE has been to develop bonding processes that are suitable for use with low-temperatue polymer substrates such as PET (polyethylene terephthalate). Through our previous research and current support from the Centre, we have successfully developed low temperature processes for both silicon-on-flex and flex-on-flex packaging, using novel laser heating and thermosonic bonding. The support from the Centre has been excellent and this project has particularly benefited from professional industry links supplied by the Centre. In addition, the well-organised InnoLAE conferences have been very useful for catching up on state-of-art research developments in plastic electronics, and for understanding the packaging needs of companies in the large-area electronics sector.

All the industry support for this project was initiated by friendly talks with the companies in the 2016 InnoLAE conference.

What does your relationship with industry look like?

It has been very important for us to interact with industry in the ITAPPE project, because our industry partners have efficiently supplied us not only test samples, but also technical support. In return, we believe this project will bring industry an innovative low cost packaging solution for large-scale manufacturing of hybrid plastic electronics in the near future.

In the year to come we will continue our research success from the ITAPPE towards a system integration project.

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