Graphene Based Optoelectronics:

Smart applications on light-matter interaction

Sensors for ubiquitous sensing purposes should be low-cost, invisible and seamlessly integrable with many different surfaces such as bendable plastic, textiles and glass. Graphene based light sensors are inherently flexible and transparent which can be integrated with low-cost CMOS technology, hence providing a disruptive platform for future wearables and vision devices.

In this first part of my talk, I will discuss my current research interest, namely, the graphene-quantum dot hybrid photodetector technology, and its applications on personal wellbeing. By providing results on capabilities of 2D materials, I will give a brief demonstration of graphene based wearable prototypes that I fabricate and test regularly.

In the second part, I will revisit my PhD research by discussing the light matter interaction in graphene based optoelectonic systems. I will show promising flexible graphene technologies including optical modulator, electrochromic smart windows and electronic paper that controls and modulates the light in a broad spectrum, which yielded promising results in the field of graphene-based optoelectronics.

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