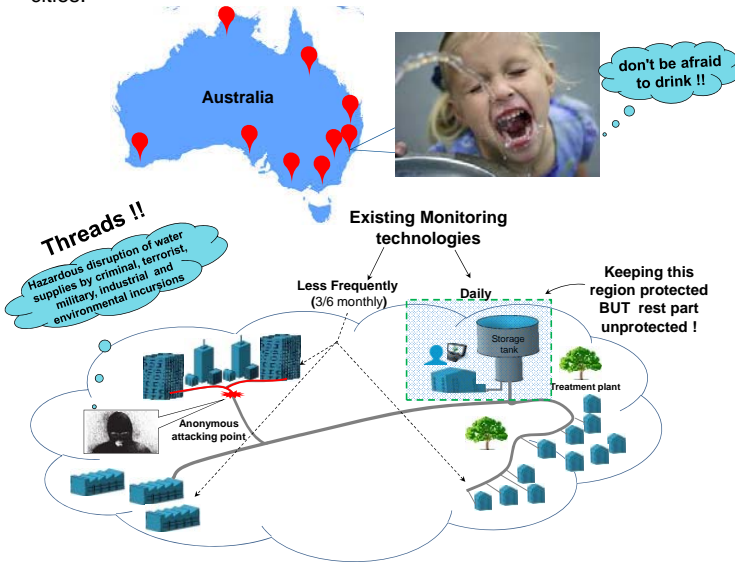


## INTRODUCTION

### Motivation

The regular and real-time monitoring of water quality is likely to become an essential feature of urban life. Governmental regulations, for example in Australia, demand safe drinking water at all tapping points around cities.



Growing local and global risk of water disruption necessitate more frequent and increased number of measurements

### Solution

The Lab-in-a-phone technology: a smartphone fluorometer for water quality assessment. The monitoring system can be enhanced by integrating with the growing Wireless Sensor Network.

## WHY SMARTPHONE BASED SENSING ???

- Large market share— already 1.2 billion subscribed by the end of 2013
- Portable and wireless connectivity
- Lot of sensitive in-built sensors
- Open source computing platform

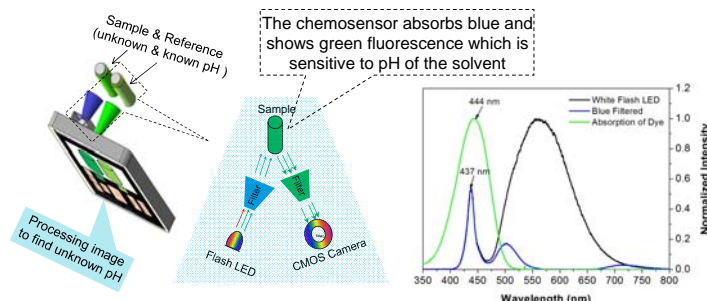


## LIMITATIONS OF OTHER APPROACHES

- Require external optical source (LEDs, Laser Diodes driven by external power supply) and more optical components— limits device accessibilities in many parts of the world
- Sometimes need communication with others

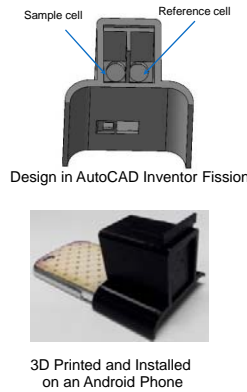
## IN OUR APPROACH

- Used in-built flash LED— greater irradiance, driven by an internal circuit
- Fluorescence detection technique for greater sensitivity and specificity
- pH of tap and environmental water is analyzed: as a case study

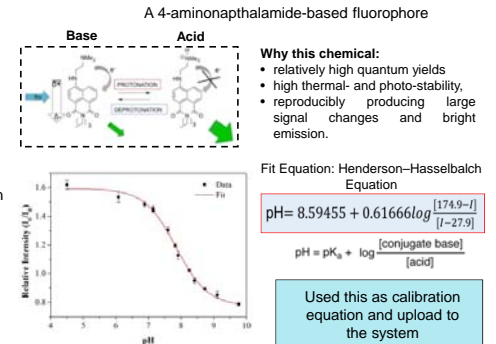


## MATERIALS AND METHOD

### Opto-mechanical Hardware



### Chemicals

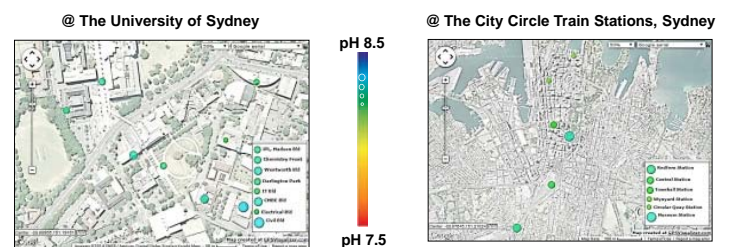


### Android-based Application



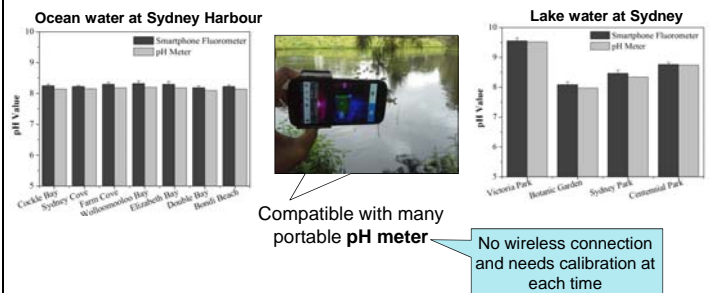
## FIELD APPLICATIONS

### pH Mapping of Tap Water



Acceptable pH range ~ 6.5-8.5  
 We measured ~ (7.89 - 8.27) ± 0.10

### Environmental Water Monitoring



## SUMMARY

- A true lab-in-a-phone technology: almost everything self-contained— no external source is required
- Perfect for quickly identify any disruption happening in water quality
- Significant potential for many other applications including environmental monitoring and remote biological analysis
  - The dye can be engineered for other applications
  - The attachment can be adjusted for other even many at the same platform