Student Research Training Project

AI Image Analysis for Nanotechnology

Advisors
Prof. Huan Hu & Prof. Mark Butala
ZJUI Institute

Need one ME and Two ECE Students

Advisor Information

Prof.
Huan Hu

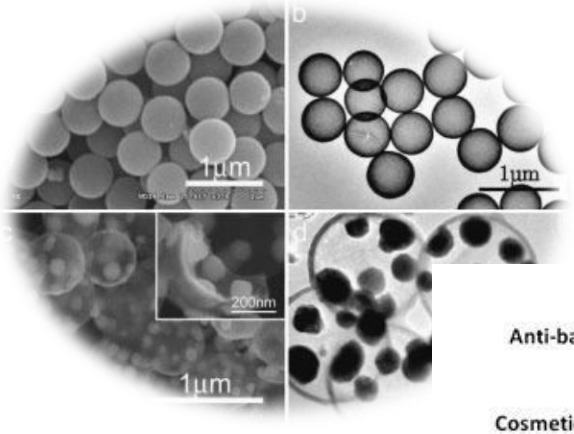
Expertise:
Micro/nanomanufacturing
Biomimetic Sensors
Micro/nanofluidics
Tactile sensors
Wearable sensors

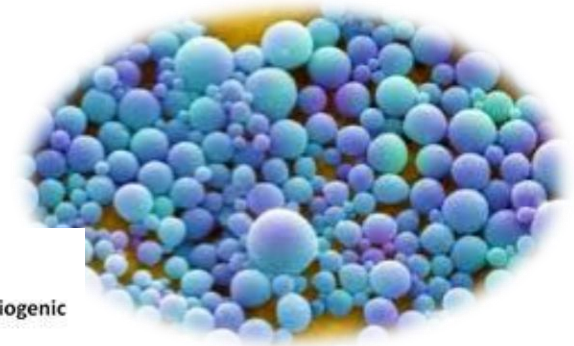
Prof.
Mark Butala

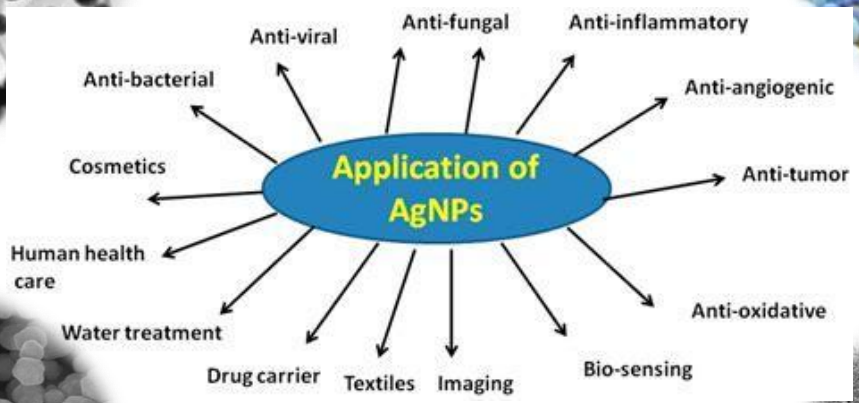
Expertise:
remote sensing, image reconstruction and tomography
statistical signal and image processing theory and application.

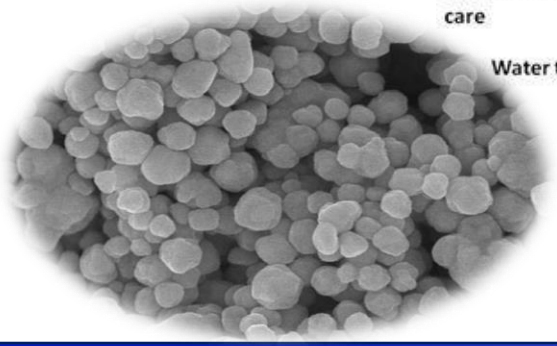
Motivations

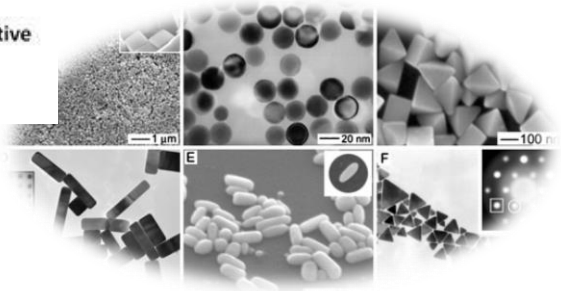
Nanotechnology is revolutionizing our society in every aspects. Nanoparticles are one of the most important building blocks in Nanotechnology. It is crucial to analyze diameters and count numbers of nanoparticles.





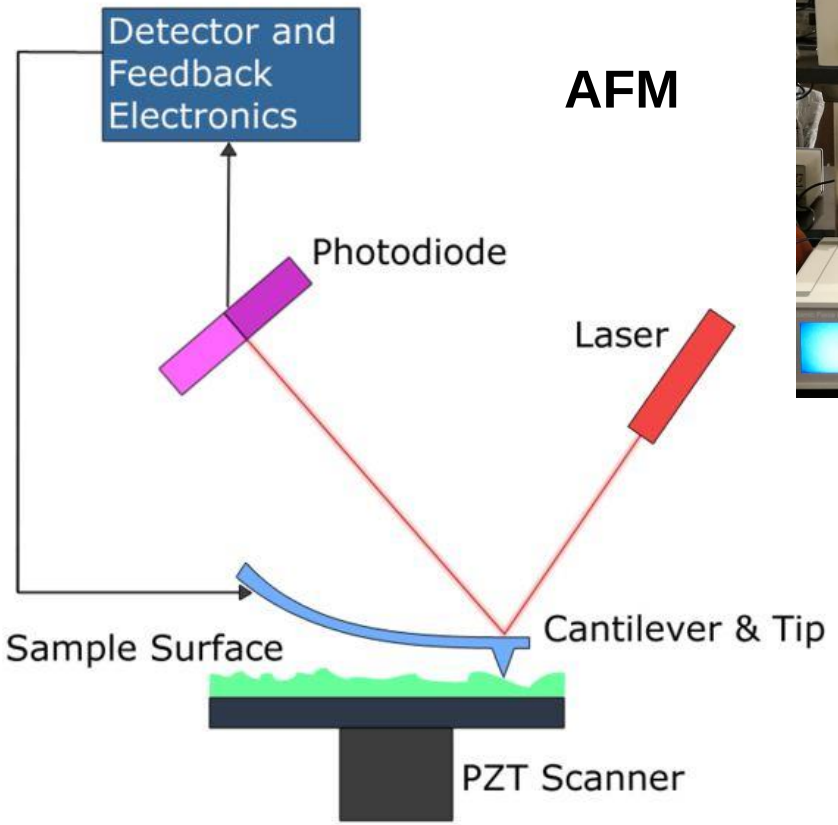


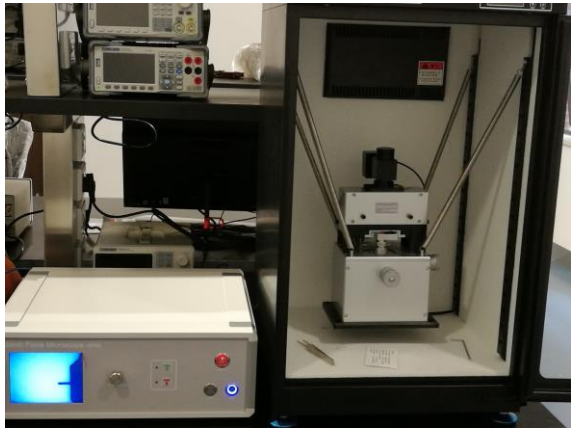


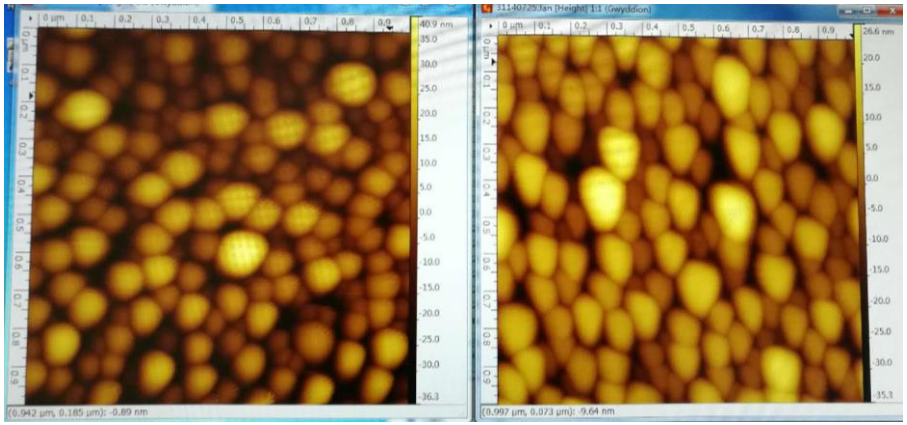


Atomic Force Microscope

One of the greatest invention in physics that is capable of exploring the nanoscale world with nanometer resolution.







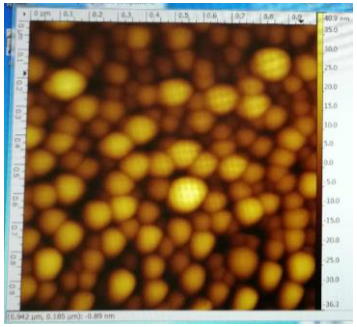
Research Goals

1. Learn to use the atomic force microscope to measure nanoparticle samples. Scan the sample to get topography images of nanoparticles

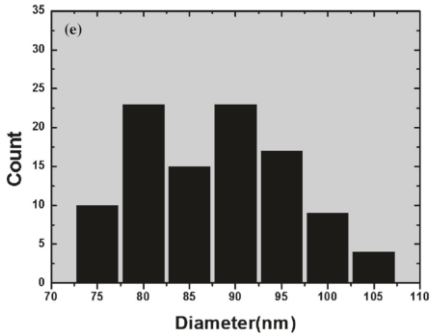
2. Learn image analysis techniques to process images to obtain nanoparticle sizes and numbers, finally get a histogram of nanoparticles

3. Learn basic AI principle and apply it to improve image analysis

Use AFM to scan many samples



Get images



Get Histogram

Skills you will learn

- Atomic Force Microscope
- Image Analysis. Image J
- Python or Matlab
- AI principle

Prerequisite

- **GPA>3.5, we suggest you to spend more time to improve GPA, and join SRTP later.**
- **Good Python programming skills**
- **Know some basics about Matlab**
- **Good Self-learning capability**

Minimal Commitment

- **Read paper and write reports and present research progress once every two weeks**
- **6 weeks full time in summer vacation 2019**
- **6 hours/week for experiment**
  - 3 hours/session, two sessions per week