# Yi Liu

1347 N Lincoln Ave Apt 2052B, Urbana, IL, 61801 liuyifly@gmail.com 217-778-9742

## Education

**University of Illinois at Urbana-Champaign** May 2017(Expected)
Ph.D. in Nuclear, Plasma and Radiological Engineering (Advisor: Clair Julia Sullivan)

**Tsinghua University** July 2013
Master of Engineering in Department of Engineering Physics (Advisor: Yigang Yang)

**Tsinghua University** July 2011
Bachelor of Engineering in Department of Engineering Physics

## Selected Courses

Machine Learning; Signal Processing; Random Process

## Researches and Projects

**Recognition of Highly Overlapped Elliptical Object**

- Proposed an algorithm using support vector machine (SVM) and principle component analysis (PCA) for elliptical object recognition in superheated droplet detector (radiation sensor) readout system
- Implemented the algorithm in both Python and Matlab and compared machine learning method with two other generally used approaches (hough transform and curvature analysis)

**Nuclear Forensics Driven by Geographic Information Systems and Big Data Analytics**

- An on going research to identify suspicious abnormal radiation activities through analysis of live big data coming from sensor network (comparable with mobile phone network), geographic information, weather data and traffic information
- Applied Amazon Cloud Service and Hadoop at very first stage of the research.

**Simulation Programming in Physics**

- Independently implemented Monte Carlo methods for complicated engineering models
- Proposed optimization methods for radiation sensors through analysis of data from the simulation

**Relation Information Extraction from Time Serious Data**

- Proposed an explicit mathematical model for the time interval distribution of events from a coincidence sensor
- Implemented the mathematical model with C++ and Matlab

**Objects Recognition from Satellite Images**

- Designed an object recognition approach using support vector machine (SVM) and principle component analysis (PCA)
- Implemented with Matlab and achieved an accuracy higher than 99% for pool recognition in a test data set containing 138012 instances

**Two dimensional K-D tree**

- Optimized regional search and nearest-neighbor search algorithm that it is approximately 20% faster in average than general implementation
- Implemented with C++

## Skills

C/C++; Python; Matlab

## Publications

[1] Superheated droplets detector for thermal neutron detection. Yi Liu, et al. 2015 IEEE NSS/MIC.
[2] Research of $^{9}$Be photoneutron source used in the photoneutron and x-ray radiography system. Yi Liu, et al. 2013 IEEE NSS/MIC.
[3] Research of $^{10}BF^{3}$ surrounded plastic scintillator as fast neutron detector. Yi Liu, et al. 2012 IEEE NSS/MIC.
[4] Detection of high-Z materials using 7MeV X-rays scattering. Weiqi Huang, Yigang Yang, Yuanjing Li, Yi Liu, et al. 2011 IEEE NSS/MIC.
[5] Nuclear material identification by photoneutron and X-Ray radiography. Yi Liu, et al. 2011 IEEE NSS/MIC.