More about the development of Songwell's Academic life

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As you can see below, I have acquired a strong EE background both in Power and Information Engineering. And CS courses is also a complement to the fields of EE. Based on these courses, I am doing some inter-disciplinary researches under the direction of various brilliant professors affiliated with EE & CS. (I draw a sketch about my research experience on my own; more details please refer to `https://sites.google.com/site/songwellxie/research`).

<table>
<tr><td>Introduction to Engineering for Electronics B</td><td>Introduction to Computer & Programming</td><td>Programming and Data Structures</td><td>Linear Algebra</td><td>Probability and Stochastic Process</td></tr>
<tr><td>Introduction to Engineering for Electronics C</td><td>Mathematical Analysis I/II</td><td>Physics I/II</td><td>Discrete Mathematics</td><td>Circuits and Electronics</td></tr>
<tr><td>Communication Principles</td><td>Signals and Systems (incl. Functions of Complex Variables)</td><td rowspan="2">Academic Curriculum of Shangyu Xie</td><td>Software Engineering</td><td>Computer Organization & Architecture</td></tr>
<tr><td>Fundamentals of Applied Electromagnetics</td><td>Electromagnetic Field & Energy</td><td>Control Theory</td><td>Computer System Engineering</td></tr>
<tr><td>Principles of Wireless Communications & Mobile Internet</td><td>Fundamental of Electrical Power System</td><td>Power Electronics & Technique</td><td>High Voltage Engineering</td><td>Computer Networks</td></tr>
<tr><td>Fiber Broadband Communications Network</td><td>Relay Protection Theory of Power System</td><td>Power System Automation</td><td>Smart Grid</td><td>Computer Security</td></tr>
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Figure 1: My Academic Curriculum

Primarily, I do focus on the Smart Grid——with the development of traditional power system into smart grid, the revolution also arouse many serious problem for a relatively open and volatile system, particularly for the integration of renewable resources, for example, the security issue caused by some malicious attack, the privacy of users data , etc. Moreover, the convenience and fastness of real-time information exchange also may cause a series of challenge to the current plan and operation of power system, and further concern with power investment and economics.

And I believe that the traditional power grid would reach at a new height by the widely used application of CS & IE technology. I am determined to make something out of me under this direction in my future academic life.

Motivated by the acknowledgement, I have been occupied with serval topics as following:

Load Forecasting by Data Mining The load forecasting is the first research topic of me in power filed. The idea struck me that we can refer to the development of a city to forecast power load, via assigning tricky weights to various objects of a citys through Data Mining technology.

Data Security of AMI I decided to focus on the AMI as my course project of computer network, in communication level. And my biggest point is that I dig it from the fundamental thing—-Smart Meter. I analyzed and set up a model for smart meter, then try to find corresponding mechanisms for its security issues.

Crowdsourcing As the research topic of mobile application, I studied the basic mathematic principle things, and it came out to me whether we can just take the advantage of large number of metering information in power system to do some things.

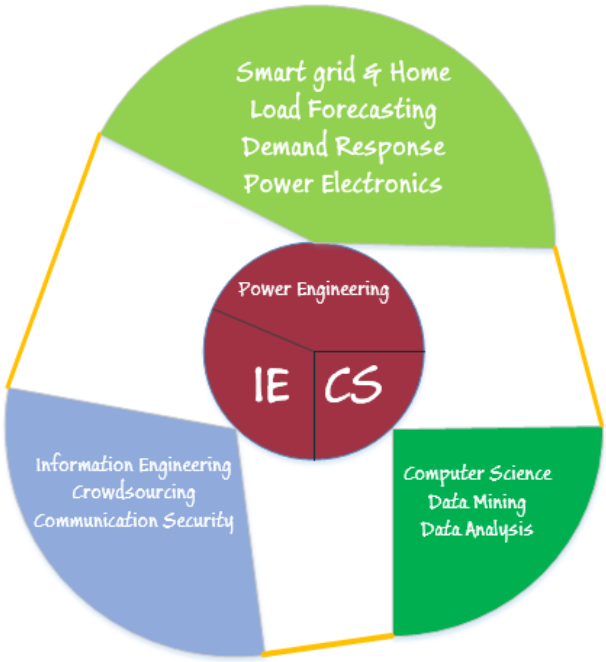

Figure 2: My Academic Components

Above all, I also try my best to do some basics of power filed:

Power Electronics I have been working in power electronics lab from the beginning of this semester, help to do some primary work, designing circuit and testing the power components. Besides, I also try to work out on a new topology of inverter.

Electrical Machine I have been recommended by professor to represent the university team to working on a flywheel storage for CaDRE Program. I mainly take responsibility for mechanics-electric part and integrating port for grid. 2015 Student Day CaDRE Program is hosted by Innovation Node-Los Angles funded by U.S. National Science Foundation Innovation Corps Program, which is expected to compete in Beijing, Sep, 2015.

Power Economics As an essential part of power system, I mainly take the project—Research Model and Application of Transition of Dual Economics in Henan State Grid funded by the National State Grid of Henan, and do the power load forecasting at first, now focus on the risk assessment.

In a word, I am willing and ambitious to pursue my goal in academic life. And my biggest dream is becoming a professor, working, cultivating and loving.

Figure 3: My Research Key-Words
(the heavy weight of *data mining* owe to selective study)