

Intern Research Topics

Number	P1
Project title :	Important Issues for Renewable Generation Integration into Power Systems
Description of the research	This research is to understand important issues for the impact of high penetration of renewable generation integration on power system operations and the corresponding strategies to reduce the risks, such as renewable power forecasting, inertia control, power system modeling, energy storage system, generating unit scheduling, and power system stability.
Mentor in CCU	Prof. Yuan-Kang Wu Dept. of Electrical Engineering, National Chung Cheng University, Taiwan, ROC. (e-mail: allenwu@ccu.edu.tw)
Expected student level	☐ Post-graduate student ☐ Third/forth-year undergraduate senior student ☒ Both
Intern period	At least 12 weeks between March1 and Aug. 31

Intern Research Topics

Number	P2
Project title	Study on the topics of biochemical engineering and biomedical sciences
Description of the research	This project aims to recruit undergraduate and postgraduate students from the universities in South and Southeast Asian countries to CCU laboratories for technical training and short-team research. Topics of research cover biochemical engineering (applied microbiology, enzyme engineering, protein expression and large-scale production), systems biology, metabolic network simulation, cancer epigenomics, and neurodegenerative diseases. Each student can choose one of those topics and work on a laboratory in either the Department of Chemical Engineering or the Department of Biomedical Sciences.
Mentor in CCU	Prof. Wen-Chien Lee Dept. of, Chemical Engineering National Chung Cheng University, Taiwan, ROC. (e-mail: chmwcl@ccu.edu.tw)
Expected student level	☐ Post-graduate student ☐ Third/forth-year undergraduate senior student ☒ Both
Intern period	At least 7 weeks between March 1 and Aug. 31

Intern Research Topics

Number	P3
Project title	Numerical simulation of OH species in atmospheric-pressure helium dielectric barrier discharges
Description of the research	Atmospheric-pressure helium plasmas have been developed extensively in the last two decades for various biomedical applications such as wound healing, cancer treatment, and sterilization due to the efficient generation of reactive species. The OH species is one of the major reactive species in applications. This project will conduct numerical simulations by using the one-dimensional plasma fluid model (PFM) in atmospheric-pressure helium dielectric barrier discharges to model the generation and destruction mechanisms of OH species. The PFM solves the species continuity equations, electron energy density equation, and Poisson equation for obtaining the species concentrations, electron temperature, and electric field, respectively. The simulated results will be validated with experimental measurements and the OH generation mechanisms will be studied.
Mentor in CCU	Prof. Kun-Mo Lin Dept. of Mechanical Engineering National Chung Cheng University, Taiwan, ROC. (e-mail: imekml@ccu.edu.tw)
Expected student level	☐ Post-graduate student ☐ Third/forth-year undergraduate senior student ☒ Both
Intern period	At least 8 weeks between March 1 and Aug. 31

Intern Research Topics

Number	P4
Project title	Skeleton-based action recognition and prediction based on deep learning approach
Description of the research	This research is to recognize or predict human's action (stand, walk, run, fall-down, talking, etc.) from the skeleton sequences that are generated from the single-view video. Our approach will be based on machine learning techniques such as CNN, RNN, or LSTM (deep learning). This technique is useful in video surveillance, health caring, or human-computer interaction, to monitor persons' daily life. The intern student is expected to have some preliminary knowledge on NN (neural network) or deep learning and skilled in Python programming. He/She will learn how to apply state-of-the-art deep learning techniques to solve the indicated problems.
Mentor in CCU	Prof. Wen-Nung Lie Dept. of Electrical Engineering, National Chung Cheng University, Taiwan, ROC. (e-mail: ieewnl@ccu.edu.tw)
Expected student level	☐ Post-graduate student ☐ Third/forth-year undergraduate senior student ☒ Both
Intern period	At least 8 weeks between March 1 and Aug 31

Intern Research Topics

Number	P5
Project title	Silicon photonics and optical biosensors
Description of the research	The topic is to develop (a) new types of silicon-based, CMOS compatible photodetectors, which have many advantages over conventional III-V based counterparts for mid-infrared applications, (b) new disposable optical biosensors for cost-effective and rapid biomedical detection for precise medicine. This internship program is open for talents who are interested in advanced optoelectronic-sensing technologies. Focus will be placed on designing, simulating, and analyzing new Si-based group-IV photodetectors and optical biosensors. For related information, please refer to the website of our lab at https://ccuphotonics307.wixsite.com/ccuphotonics307
Mentor in CCU	Prof. Guo-En Chang Dept. of Mechanical Engineering National Chung Cheng University, Taiwan, ROC. (e-mail: imegec@ccu.edu.tw)
Expected student level	☐ Post-graduate student ☐ Third/forth-year undergraduate senior student ☒ Both
Intern period	8 weeks

Intern Research Topics

Number	P6
Project title	Effect of operating conditions on the performance of an all-vanadium redox flow battery
Description of the research	The performance of the VRFB is influenced by operating conditions, such as electrolyte concentration and electrolyte flow rate. Students will conduct experiments to investigate the effect of operating conditions on the performance of the VRFB and determine a suitable operating strategy.
Mentor in CCU	Prof. Yong-Song Chen Dept. of Mechanical Engineering, National Chung Cheng University, Taiwan, ROC. (e-mail: imeysc@ccu.edu.tw)
Expected student level	☐ Post-graduate student ☐ Third/forth-year undergraduate senior student ☒ Both
Intern period	At least 8 weeks between March 1 and Aug. 31