Cross Research Group/Lab @ Tokyo Tech

Schools: Environment & Society/Materials and Chem. Tech.

Transdisciplinary Science and Engineering / GEDES / Energy Course/ Materials Science

Tokyo Tech Energy Course

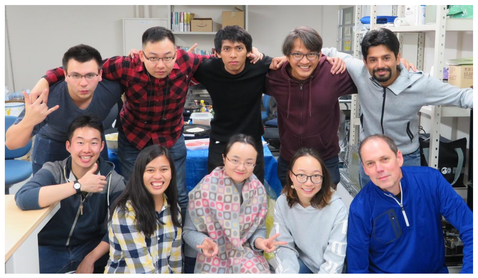
TSE TOKYO TECH

Prof. Cross

Prof. Cross is an American that has lived and worked both in Japan for over 25 years.

In his lab, 15 students are encouraged to propose their own novel research project and publish their results. The output-driven lab atmosphere supports international and Japanese working styles. Both Japanese and international students learn American English technical communication skills and critical thinking.

This poster summarizes the lab research topics and educational activities. Please see the lab website for more information.



Teaching/Seminar

Prof. Cross teaches graduate courses on Academic Writing and Energy & Environment. He also teaches undergraduate courses on Online course creation, Video-making, Energy resources, Materials and Molecular Engineering. He holds his lab seminar in English where he provides research guidance to students in the lab.

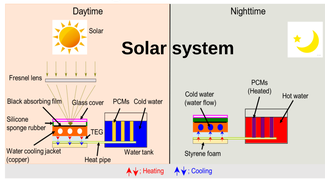
Online Education

Prof. Cross founded and manages the Online Education Development Office (OEDO). He has produced a number of edX Massive Online Open Courses (MOOCs). Prof. Cross works closely with teaching assistants and staff to develop educational technology and improve MOOC quality using learning analytics.

He won the best paper award at the 2019 IEEE conference on Learning with MOOCs.

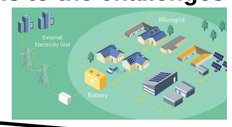
Energy Policy Group

The energy policy group research focuses on international grid interconnections (Japan-South Korea) and their impacts on electricity generators and suppliers (Japan); solar water heating for all-day energy harvesting & CO_2 emissions reduction; monitoring, restoration and carbon sequestration potentiality evaluation of seagrass ecosystem, and development of community microgrids in urban residential area of Mongolia.



Climate change is the greatest challenge of our time. Energy issues are particularly complex, and cross multiple fields of knowledge. In Professor Cross' Laboratory, a small group of motivated students with engineering, economics, and computer science backgrounds are the "Energy Policy" group, which contributes at its scale and in different ways to provide energy solutions to the challenges currently faced by society.

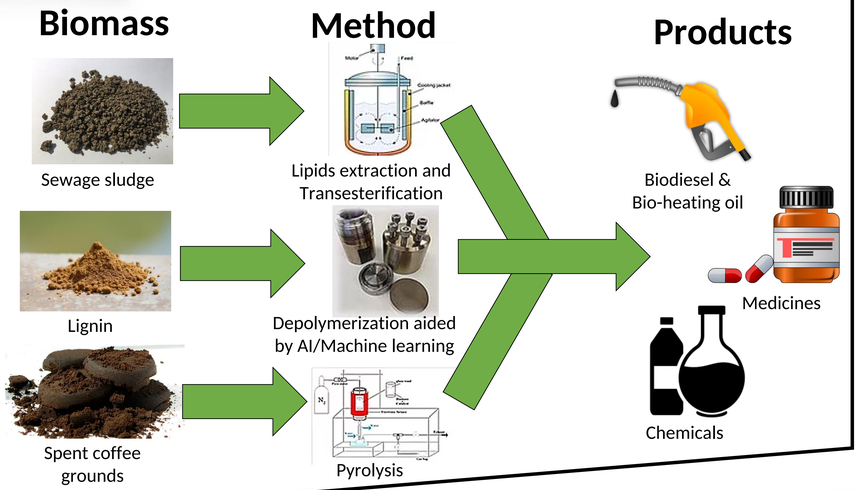
microgrid

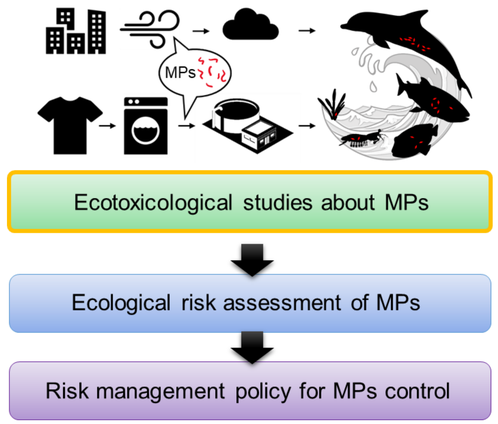


Biofuels Group

As countries worldwide strive for net zero greenhouse gas emissions, there is a growing need to make use of biomass and wastes as starting materials or reactants for pharma, chemicals and fuels.

The biofuels group transforms biomass and wastes into valuable products by using knowledge of chemicals, machine learning and process engineering to develop economically attractive synthesis routes for biofuels, bio-heating oils, chemicals or medicines.



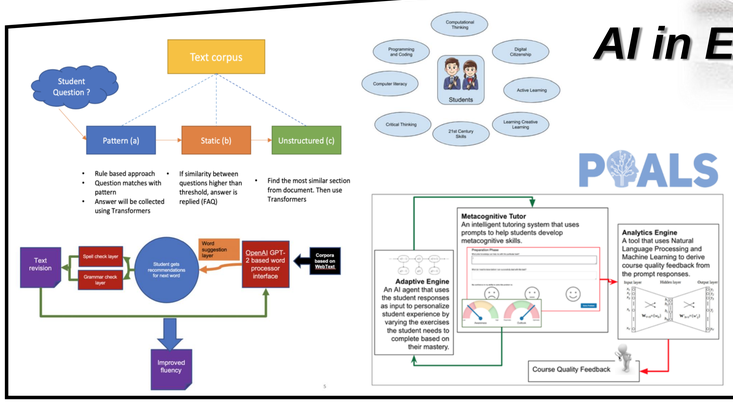


Assistant prof. Cheng Shuo

Asst. Prof. Cheng's research focuses on the toxicological evaluation of microplastic and the energy conversion of solid wastes based on thermal chemical and plasma technology.

Her research covers environmental science and engineering. She looks forward to working with students, visitors, and overseas fellows on research collaborations.

AI in Educational Group



The students in the AI in Education group currently work on metacognition, self-efficacies, and writing assistants, and conversational chatbots in education, among others. They are interested in understanding how technology, artificial intelligence in particular, can improve education and assess the effectiveness of these new methods.

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