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Surrey Prof. gets £2M for AI driven clean energy

20 April 2023



The University of Surrey's Professor **Jin Xuan** has won a prestigious Open Fellowship from the **Engineering and Physical Sciences Research Council** (EPSRC) to develop the next generation of clean energy devices using advanced artificial intelligence.

As well as using electrochemical technology to explore established applications like green hydrogen production and CO2 reduction, Prof Xuan will also develop future technologies, with a particular focus on cleaner, greener fertilisers.

Prof Xuan said:

"Manufacturing fertiliser to help crops grow is hugely carbon intensive, but if we can achieve a breakthrough on the difficult electrochemical reduction of nitrogen to generate ammonia, we could make significant steps to address this.

"The answer lies in artificial intelligence to design the complex electrochemical devices, but many existing algorithms in this area don't offer explanations for how the AI comes to its conclusions. The relation between the inputs and outputs is a mystery, but I plan to open the 'black box' to find results which are reliable, explainable and transferable."

The five-year fellowship will enable Prof Xuan to develop Explainable Artificial Intelligence tools and models which lead to an automated loop of materials design, manufacturing and testing of electrochemical devices. Prof Xuan will work with industrial partners from Siemens PSE, Intelligent Energy and Johnson Matthey.

Prof Xuan said:

"My ambitions for this research are huge and can only be achieved with long-term support like this. The flexibility offered to me through this fellowship will enable me to shape my research as findings emerge, following the solutions which reveal themselves through my work, in partnership with other academics and industry. I'm extremely grateful to the EPSRC for this support."

President and Vice-Chancellor of the University of Surrey, Professor **Max Lu**, said:

"Jin exemplifies Surrey's values of inspiration and innovation. He is ambitious about solving global challenges, working collaboratively with interdisciplinary researchers and innovators. We're very proud of him for winning this fellowship."

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