



UNIVERSITY OF
BIRMINGHAM

ANSYS Granta, Intellegens, and University of Birmingham Secure Funding to Improve Battery Metrics with Artificial Intelligence

A collaboration between ANSYS Granta, Cambridge AI start-up Intellegens, and the University of Birmingham has secured funding from the Faraday Battery Challenge to optimise the battery manufacturing processes helping ensure the UK leads the world in the transition to a low carbon economy

Cambridge, UK | December 12, 2019. Innovate UK, part of the UK Research and Innovation organization, is investing £246 million in innovation projects over 4 years. The *Faraday Battery Challenge: Innovation for Feasibility Studies Round 3* is aimed at supporting business-led R&D for the design and development of batteries for electric vehicles. The collaborative grant was awarded to ANSYS Granta, Intellegens and the University of Birmingham to apply artificial intelligence solutions to predict optimum process parameters for complex interdependencies in the battery manufacturing process.

It is estimated that around 50% of the value of future vehicles will be associated to the battery and the systems that support it. By 2022, the UK battery demand will be sufficient to support one UK gigafactory (large battery manufacturing plant that produces cells and modules used in electric vehicles). This presents a major global opportunity for the UK, since the complete supply chain for batteries for electrified vehicles at the scale seen in the automotive sector does not yet exist. Lithium-ion battery (LIB) manufacturing is in its early days in the UK. Seizing this opportunity will allow the UK to position themselves as industry leaders in battery research. The development of new battery technologies is slow, taking many years to both in terms of new technologies and, more importantly, the substantial manufacturing challenges needed to be scale up production. The Faraday Battery Challenge aims to ensure that the UK spearheads the research in the design, development and manufacture of batteries which will allow businesses to kickstart the transition to a low carbon economy. The future widespread adoption of electric vehicles will result in reduced harmful emissions and cleaner air, among other social and economic benefits.

A consortium comprised of ANSYS Granta, Intellegens and the University of Birmingham (UB, Prof. Emma Kendrick), won the Faraday Battery Challenge: Innovation for Feasibility Studies Round 3 to develop new tools to speed up the manufacturing processes of batteries. The project titled Intelligent Battery Data Management Platform (IDMBAT), proposes to use artificial intelligence to reduce fabrication and development costs while improving key battery metrics. Intellegens' role is to provide their cutting-edge deep learning predictive models (Alchemite™) for process parameter prediction. ANSYS Granta will build and test the data platform and the University of Birmingham will bring battery technical leadership and will host a small-scale manufacturing facility to generate data. The new intelligent data management platform will enable battery technology manufacturers to overcome technical and commercial barriers.

Dr Alex Cazacu, Project Lead at ANSYS Granta, comments “the project will enable us to extend established best practices in materials data management to support the application of smart algorithms and to empower innovation in battery materials – two areas of great technical and commercial significance.”

Ben Pellegrini, CEO, Intellegens added, “The Intellegens team are very excited to be using our technology to help revolutionise industrial manufacturing processes and enabling the UK to lead the way in the scale up of new battery technologies. Speeding up the production of these new battery technologies is critical in addressing the urgent need for climate action”.

Professor Kendrick, UoB, “this work is extremely important for battery manufacturing, currently a lot of the manufacturing optimisation is done by trial and error, with a large matrix of experiments. If we are able to predict the change in performance of an electrode and from changes in the manufacturing processes this will reduce the development time for a new battery chemistry cell significantly”

About ANSYS Granta

Founded as Granta Design Ltd., a spin-out from the University of Cambridge, ANSYS Granta is the global leader in materials information technology – software that helps engineering enterprises to manage and apply vital information about their materials. Granta was acquired by ANSYS, Inc. in 2019 and continues to serve sectors as diverse as aerospace, defence, energy, medical devices, automotive, motorsports, manufacture of consumer and industrial equipment, and materials production. Customers realize multi-million-dollar benefits in reduced cost, enhanced product performance, improved quality, and faster design turnaround. www.grantadesign.com.

About Intellegens

Intellegens is a spin-out from the University of Cambridge with a unique Artificial Intelligence (AI) toolset that can train deep neural networks from sparse or noisy data. The technique, created at the Cavendish Laboratory, is encapsulated in Intellegens first commercial product, Alchemite™. The innovative deep learning algorithms that Alchemite™ is based on can see correlations between all available parameters, both inputs and outputs, in fragmented, unstructured, corrupt or even noisy datasets. The result is accurate models that can predict missing values, find errors and optimise target properties. Capable of working with data that is as little as 0.05% complete, Alchemite™ can unravel data problems that are not accessible to traditional deep learning approaches. Suitable for deployment across any kind of numeric dataset, Alchemite™ is delivering ground breaking solutions in drug discovery, advanced materials, patient analytics and predictive maintenance – enabling organisations to break through data analysis bottlenecks, reduce the amount of time and money spent on research, and support better, faster decision-making. <https://intellegens.ai/>

About the University of Birmingham

The University of Birmingham is ranked amongst the world’s top 100 institutions, its work brings people from across the world to Birmingham, including researchers and teachers and more than 6,500 international students from over 150 countries.

The IDMBAT project is funded by UK Research and Innovation through the Faraday Challenge Competition.