

Scientists appeal for public help with climate change technology project

July 23 2020, by Alan Williams



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Citizen scientists are being asked to play a role in developing cutting edge imaging technologies that will help us understand the effects of major threats to biodiversity.

Through the EmbryoPhenomics project, researchers at the University of Plymouth are applying bioimaging, robotics and computer vision to produce automated measurements of the size, shape, movement and function—including heart rate—of aquatic organisms.

These technologies provide a detailed, microscopic view of how the embryos of aquatic animals—such as snails and shrimps—develop and react to the changing environment around them.

To enhance this existing research capability, the team of marine biologists are now applying artificial intelligence (AI) to train software for detecting the most minute details of an embryo's development.

Training a computer using AI requires significant volumes of data and so the team are now calling on the public to get involved, by helping to analyze a vast bank of images and video.

The team have developed a new project on [Zooniverse](#), a global citizen science platform, and volunteers can simply create a free account on the site to get involved.

They will then progress through a series of tutorials, guiding them on what to measure and how, before beginning work on their valuable contribution to this project.

All the results from Zooniverse will then be used by the project team in the application of AI to training the next generation of technologies for understanding the impact of environmental change on sensitive early life stages.

The project is led by Dr. Oliver Tills, Senior Research Fellow in the School of Biological and Marine Sciences, and Research Assistant Ellen Tully, who is working on a Faculty of Science and Engineering Proof of

Concept Commercialisation project.

Dr. Tills, who recently received a UK Research and Innovation's Future Leaders Fellowship to support his work, said:

"The laboratory and field-based technologies we are developing are an exciting step-change in being able to assess the biological impacts of environmental change in early life stage aquatic animals. We are developing technologies for both the laboratory and for deployment in the field, and are excited to call on the public to help us in creating a dataset to train these technologies to measure biological responses. Before lockdown, we were working alongside our undergraduate students on this task—but we have barely scratched the surface. We have an enormous volume of images and video to work through. However, the current circumstances have allowed us to extend this work to a much larger audience, enabling people across the world to be part of our project and to really accelerate this process."

EmbryoPhenomics as a concept was first outlined in a research paper published in *PLoS Biology* in December 2018, and since then Dr. Tills has been continuing its development in the form of different technologies at the University and in partnership with Plymouth Science Park (PSP).

PSP has provided space within its Enabling Technologies Lab allowing the research group access to 3-D printers and workshop space. The park has also made available a working area in their business incubator space, Formation Zone, and provided collaborative input throughout the early stages of this project.

Ian McFadzen, CEO at the park said:

"We are proud partners of EmbryoPhenomics and are delighted to see

the development in their important work, which will provide a visualization and quantification of dynamic processes to scientists working on a range of projects."

More information: Oliver Tills et al. A high-throughput and open-source platform for embryo phenomics, *PLOS Biology* (2018). [DOI: 10.1371/journal.pbio.3000074](https://doi.org/10.1371/journal.pbio.3000074)

Provided by University of Plymouth

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