5µm Wearable Lifesaver

Hawley is so proud that **Willow, Rowan and Justin** in Year 6 have succeeded in making it to this year's finals of the Longitude Explorer Prize! The Longitude Committee is a prestigious organisation that funds research into medical and scientific projects. The Longitude Explorer Prize is aimed at secondary school pupils and our three are the youngest competitors, so reaching the finals is an incredible achievement in itself.

They applied to Longitude back in November last year, and were told they had made it to the finals in March. They never would have thought they would have to do their work remotely, without being able to be together, but have spent lockdown learning about AI, on zoom calls and using seesaw to share and learn. They went on to design the product, produce a business plan and video, as well as interview experts from the world of science and AI. The result of their research and hard work is a wearable device which will help predict and detect blood clots, warning the wearer of imminent danger.

It is now in the hands of the judges for the overall prize, but there is also a "people's vote" where anyone can vote for the proposal. This will award **£5,000** to the school/community club that the team is from; a great opportunity for Hawley! Please take a few moments to vote for their entry. It will only take 10 seconds! Here is the link - look for their entry, which is called **5µm Wearable Lifesaver** - where you can see all the Longitude Prize entries and how it is helping encourage interest in AI.

https://longitudeexplorer.challenges.org/vote/

Their entry is called: **5µm Wearable Lifesaver**

Voting closes at midnight Friday, 3rd July

Please feel free to invite friends and family to vote too.

Well done Willow, Rowan and Justin.

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The following is from their entry to the competition, explaining the problem and their ideas to help:

The problem is that blood clots can be a sign that a heart attack might happen or that the patient might have a stroke, affecting the person's ability to lead a full life or even lead to death.

If blood clots could be detected it might be possible to help the person faster, so they recover quicker, or don't even get the heart attack or stroke.

If it was possible to break-up these blood clots as they start to form, even better health outcomes could be achieved.

If the device is linked to an AI it might begin to detect if there are changes in the blood that are causing the blood clots.

Collecting information from lots of sources and people, then using AI to look for common trends, will help doctors understand causes and the full range of effects from clots.

The devices of at risk patients could alert their doctor.

Tailored medical best practice, (lifestyle, diet, exercise), would be provided to the wearer.

In addition, someone admitted to hospital would have a history of their blood available to doctors.

The theme is living better. Preventing heart attacks or strokes is clearly going to help people live better.

Our concept: A new wearable device.

This unique object differs from other devices, with the power to save lives and alert you if you need medical treatment.

It can detect blood-clots inside your body. We have researched two types of potential detectors, Radio-Frequency Sensors: Technology being developed by Imperial-College, or Ultrasound which is common in medical applications. NovoSound Ltd. produces watch sized flexible Ultrasound sensors.

We also require our device to be able to break-down blood clots. We have researched ultrasound being used to breakdown clots: The work by Dr. Xu and team at University-of- Michigan: "Non-Invasive Ultrasonic-Thrombolysis Using Histotripsy." (pulsed sound-waves to fragment blood clots). This is the type of technology we plan to incorporate.

We plan also to measure blood oxygen levels using current technology to give a health picture.

The device would be a watch which monitors blood quality and other health things such as heart rate, exercise, diet and sleep. These simpler functions are what competitors offer from their watches.

Competitors are Apple and Withings, but neither are medically approved. Ours is a huge leap beyond these competitors, it has the potential to save millions in medical treatment. In the US 300,000 die from blood-clot related problems; to solve these problems means 2-3 days in hospital.