



Computational Foundry

As told by Simon Robinson, Jennifer Pearson, and Alan Dix



How do you describe your lab to visitors? The Computational Foundry is much more than just a lab: It is an idea of the future, creating a bright beacon of hope and

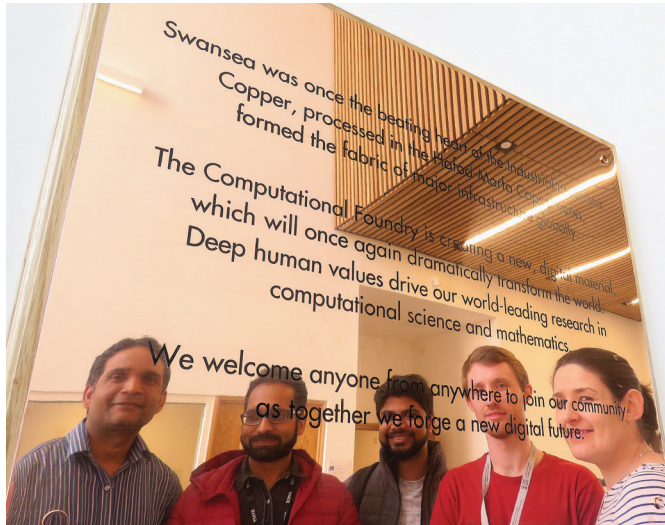
light that puts humans at the center of everything we do. We are in Swansea, Wales, where 200 years ago the people of this place forged and shipped out copper, transforming the region and the world. Today the Foundry will make this city, the region, and the nation proud by forging new types of material—this time digital—that will go out into every type of infrastructure worldwide.

What is a unique feature of your lab?

This lab is intimately connected to the past and yet helping to unfold the future. The name is a pivot point between the industrial heritage of Swansea in the 1800s—the ambition at that time being to have impact at scale with physical materials—and the future, where we already see that digital materials are powerfully shaping all of our futures. But there is a darkness descending on the digital: worries about the ways in which artificial intelligence, big data, and computation in general are advantaging some and disadvantaging others, saying that there is truth in lies and that automation and the artificial are better than the precious smallness of life. We are not agnostic to that problem; instead, we acknowledge and embrace it, so our philosophy is very different. We are not simply a human-computer interaction place. We are human-centered across all aspects of computation: theoreticians, visualization experts, machine learners, hardware specialists, the mathematically oriented, and the intensely practical. Together we strive to bring human-centered perspectives into everything we do.

Briefly describe a day in the life of your lab.

This particular day is a special one in the life of the lab—it is our official opening. But the special events that are taking place on this day are indicative of the ongoing spirit and future of the lab. We have many visitors here right now from a range of stakeholders—government, companies, local schools, and more.



→The Computational Foundry mission.



It is these people, physically present or in our thoughts, who are at the heart of what we do every day.

On this opening day there are also talks and events, with new directions and ambitious agendas being proclaimed. All of us from all our different perspectives are seeking to challenge the notion of what computational science is and should be: for the individual, for the family, and for society, not just today but every day. Finally, on this special day, there are balloons and bunting, popcorn and ice cream, harp music and the sound of children singing. The work that we are doing is vital, and

we take it very seriously—we are not going to say that every day we have sundaes and confetti. But every day we do have joy, fun, and excitement.

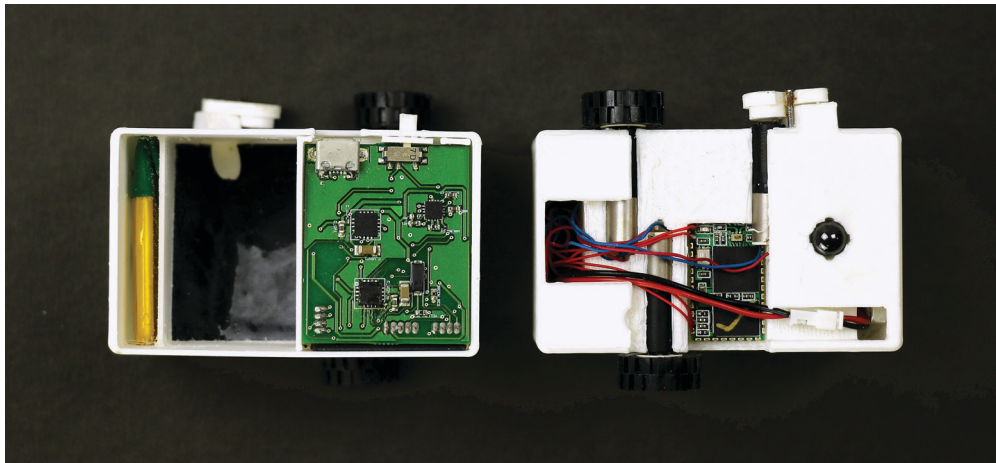
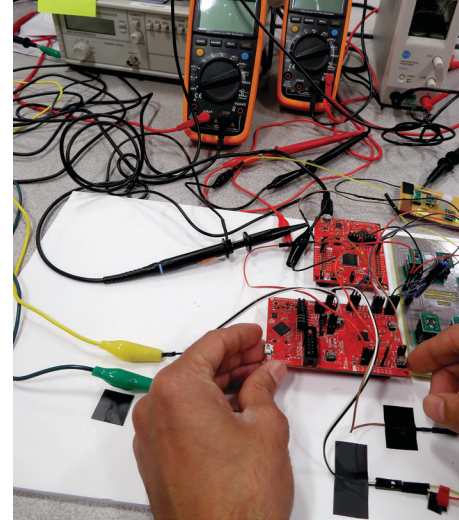
What is one feature of your lab that you could not do without? There are so many answers to this question. We are blessed with fantastic open spaces, amazing cutting-edge research labs, and brilliant colleagues and student partners. Of course, without any of those we wouldn't be the community that we are. But if there was one physical thing that we would miss if it were taken away, it would be the plaques that were unveiled on

this special day. Here is our mission engraved in copper (see photo above): We care about the future, we know that humans have to be at the heart of it, and our doors are open to everyone who has a similar passion. So please come visit!

What is one feature of your lab you want and do not have? The Computational Foundry is brand new: We have spent much time learning from other labs around the world and have built in many of the things that we see as vital for an exciting, rich research environment. The critical thing now is to encompass as wide a



→ Sustainabot: a mini robot that prints using everyday grains and foodstuffs.



← Top and bottom views of Sustainabot's internal circuitry and components.



→ Liquid metal as a programmable material for visual and tactile output.



set of perspectives as possible. We have many different views that are already shaping the technology of the future, but we are always open to more. So perhaps if you are reading this then you are the person we are missing! In October 2019 we will launch an EPSRC Centre for Doctoral Training, focused on putting humans at the heart of artificial intelligence and big data, with a range of stakeholders including Google, NHS, Facebook, and many more. If you are interested then please visit <http://people-first.best> and get in touch.

What do you see as the most important aspect of the work you do there?

The most important thing we do in the Computational Foundry is to understand that world-class research that sets agendas for communities across the globe can also connect very deeply with the small, precious, individual experience of everyday life, starting in our small part of the planet—Swansea—and then reaching out to the region, to the nation, and from there to the world.

🌐 <https://computationalfoundry.eu>

This lab is intimately connected to the past and yet helping to unfold the future.