

Riverlane, the company making quantum computing useful far sooner than anticipated

We spoke to Steve Brierley, CEO of Riverlane about being selected to join Tech Nation's Future Fifty programme, founder life and plans for the future.

Temps de lecture : minute

11 June 2024

You have recently been selected to the Tech Nation's Future Fifty programme. What are your expectations and how does it feel to be identified as a future unicorn?

We're delighted to have been selected as the sole representative of a rich and diverse UK quantum tech industry. The quantum computing market is expected to grow to \$28-72B over the next decade so I expect many unicorns to emerge, and we certainly hope to be one of them. Tech Nation has an excellent track record of picking and supporting high-growth leaders. We're excited to make the most of the opportunities the programme offers.

What was the catalyst for launching Riverlane?

Quantum computing is an amazing idea - the ability to harness the power of the atom to perform computation will transform many industries. Back

in 2016, I was a research fellow at the University of Cambridge, and at that time, the majority view was that building a useful quantum computer wouldn't be possible in our lifetime - it was simply too big and too hard a problem. I disagreed but needed to validate this. By meeting with teams building quantum computers, I saw an amazing rate of progress - a 'Moore's Law' of quantum computing with a doubling in power every two years, just like classical computers have done. That was the catalyst moment for me, and it became clear that if that trend continued, the next big problem would be quantum error correction. I founded Riverlane to make useful quantum computers a reality sooner!

Tell me about the business - what it is, what it aims to achieve, who you work with, how you reach customers and so on?

We're building a technology called the 'quantum error correction stack,' which corrects errors in quantum computers. Today's quantum computers can only perform a thousand or so operations before they fail under the weight of these errors. Quantum error correction technology will ultimately enable trillions of error-free operations, unlocking their full and transformative potential.

Implementing quantum error correction to achieve this milestone requires specialised knowledge of quantum science, engineering, software development and chip manufacturing. That makes quantum error correction systems difficult for each quantum computer maker to develop independently. Our strategy is not dissimilar to NVIDIA in providing a core enabling technology for an entirely new computing category.

How has the business evolved since its launch?

When Riverlane was founded in 2016, there was a lot of focus on developing software applications to solve novel problems on small-scale quantum computers, a phase known as the 'noisy intermediate-scale quantum' (NISQ) era. However, after the limits of NISQ became apparent due to considerable error rates hindering calculations, the industry shifted focus to building large and reliable quantum computers that could overcome the error problem

This is something we've been working on from the start - through the invention of our quantum error correction stack - but we're now doubling down on its development to meet this growing demand from the industry. An important part to this has been scaling our team to nearly 100 people across our two offices in Cambridge (UK) and Boston (US) - two world-leading centres for quantum computing research and development.

Tell us about the working culture at Riverlane?

It's a common misconception that you need a PhD in quantum physics or computer science to work in our field. The reality is we need people with a wide range of skills and from the broadest possible mix of backgrounds and demographics. Collectively, we're a group that loves tackling hard and complex problems - if not the hardest! This requires a culture that blends extremes of creativity, curiosity, problem-solving and analytical skills, plus an alchemy of driving urgency and zen like patience. I'm also proud of the extraordinary openness and diversity of our team, including a healthy gender mix in a field where this is the exception not the norm.

What is your favourite thing about being a founder?

I've been fascinated with quantum physics since I was a student. Back then, the idea of building a computer that applied the unique properties of subatomic particles into computers to transform our understanding of nature and the universe was pure science fiction. Building a company that is now achieving this feels almost miraculous. Building a company with the right mix of skills and shared focus to do far faster than previously imaginable is brutally tricky and joyously rewarding in equal parts

What's in store for the future?

Last September, we launched the world's first quantum error correction chip. As the quantum computing industry develops, these chips will get better and better, faster and faster. They'll ultimately enable the quantum industry to scale beyond its current limitations to achieve its full potential to solve currently impossible problems in areas like healthcare, climate science and chemistry. At a recent quantum conference, someone stood up and said quantum computing will be bigger than fire. I wouldn't go quite that far! But they'll unlock a fundamental new era of human knowledge and that's super exciting.

What one piece of advice would you give other founders or future founders?

Have a bold and ambitious vision that's underpinned by a proven insight and data. In my case, it was that the presumption that a quantum computer was simply too hard to ever build could be disproven and overcome. Once you have this, be ready to learn fast and pivot fast in your tactics but never lose sight of your goal.

And finally, a more personal question! What's your daily routine and the rules you're living by at the moment?

I spend at least a third of my time travelling. Meeting global leaders in our field face to face to hear their ideas, track their progress and build partnerships is priceless. When I'm home, I'm lucky enough to live about a mile from our office in Cambridge. No matter the weather, I walk to and from work every day. Cambridge is a beautiful place - the thinking time and fresh air give me energy and a calm headspace.

Steve Brierley is the CEO of Riverlane.

Tech Nation's Future Fifty Programme is designed to support late-stage companies with access and growth opportunities, the programme has supported some of the UK's most prominent unicorns, including Monzo, Darktrace, Revolut, Starling, Skyscanner and Deliveroo.



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