Enabling the next era of music gaming and the arts with Moth Quantum

As part of our quick founder questions series – or QFQs – we spoke to Ferdinand Tomassini, CEO and cofounder of Moth Quantum about bridging the gap between quantum and creative industries and bringing quantum into our daily lives.

Temps de lecture : minute

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24 August 2024

The launch of <u>Moth</u> was driven by a convergence of two passionate communities: creative professionals eager to harness quantum computing, and quantum experts keen to explore artistic applications. As early as 2017, there had been global quantum game jams, where game developers would build quantum games, and artists explored quantum and EU grants to study quantum music. This synergy was ignited in 2022 by Eduardo Miranda's influential book, "Quantum Computer Music," which compiled over 15 research papers on applications of quantum computing to music. Simultaneously, the rising public interest in quantum technology and increased accessibility of quantum machines created a perfect storm of opportunity. Moreover, as we started to look at the space in greater detail, we realised the transformative impact quantum computing would have on creative industries. We recognised this unique moment and founded Moth to bridge the gap between quantum computing and creative industries, enabling artists, game designers, and musicians to explore this new frontier today and begin to build long term research roadmaps to understand how it will transform them tomorrow.

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

Moth is a pioneering company bringing the power of quantum computing to the fingertips of musicians, gamers, and digital artists. We're on a mission to revolutionise creative expression by harnessing the unique capabilities of quantum technology.

Today, we have an exciting product lineup, all in the process of being released to market, that includes:

1. Quantum Synthesizer (Actias): Offering unprecedented sound generation capabilities.

2. Generative Music System: A quantum-powered technology that produces music with very little training parameters and in exciting ways

3. Open-Source Quantum Audio Package: A comprehensive toolkit for quantum audio processing, which will soon be available for download from our GitHub repository and website.

We're also developing consumer-facing products for the gaming industry, slated for release early next year.

We're exploring various avenues to reach our customers, and we've been encouraged by the significant interest shown through existing marketplaces and partners. A key strategy in our approach is

collaborating with leading musicians and hosting public demonstrations of our tools in action. These events will showcase the capabilities of our quantum-enhanced products before we make them available via our website or other platforms.

How has the business evolved since its launch?

Since our official launch at the beginning of 2024, Moth has exploded with a number of mainstream demonstrations of quantum computing being used by musicians. Notably, Eduardo Miranda performed live in Saudi Arabia using a quantum computer as part of the composition and ILĀ performed live at Silencio Club in Paris using the beta of Moth's quantum synthesizer – a product that any musician can use and that has received much more interest than we expected. Also, as we've started to explore the intersection of quantum approaches to generative AI, algorithmic game design and general adversarial networks, we've realised that the technology may offer incredible use cases much sooner than we thought. At the start of this year, we wouldn't have thought that we would be releasing three products and that one was a generative music system that we think musicians are going to really enjoy using – so it's very exciting.

Tell us about the working culture at Moth Quantum

At Moth, we're building the necessary infrastructure for quantum to enter our daily lives. Our team brings together scientists, creatives, and entrepreneurs, all working on the complex challenge of making quantum technology accessible and impactful.

We encourage open discussion and critical thinking, recognising that

breakthroughs often come from challenging assumptions. Our work is demanding, but there's a shared sense that we're contributing to something significant.

We try to balance our focus on innovation with practical approaches to work-life integration. This might mean taking a walk to discuss ideas (being sedentary in the office for long periods is strongly discouraged) or simply respecting the need for downtime.

Ultimately, we're committed to being a different kind of tech company - one that values both scientific rigor and creative exploration, while remaining grounded in the real-world implications of our work.

How are you funded?

Moth was boot-strapped for a long time and raised a £3M seed round at the beginning of 2024 from Serendipity Capital – an investor with a great track record in quantum computing technologies.

What has been your biggest challenge so far and how have you overcome this?

Attracting top talent and forming a world class team of people that are passionate about quantum and the arts is hard. People with expertise in quantum computing are in strong demand given the momentum in the industry and the lure of AI companies. Moreover, fewer and fewer people are pursuing quantum computing at an advanced level due to its challenging nature.

How does Moth answer an unmet need?

Creatives, whether musicians, game designers, or artists, are always looking for new mediums for their practice and many of them want access

to quantum computing technology – as many have been inspired by the concepts of quantum physics or are generally interested. Moth meets this need with easy to use, no code interfaces which allow creatives to play with the technology for the first time. Also, public audiences are very curious to see tangible instantiations of quantum computing to get an understanding of what it is. Artists that use our technologies meet this need. Moreover, in the long term, the need that quantum computers will meet for these industries will be enormous, whether in solving computational bottlenecks or in offering completely new generative technologies that enhance creative practices and experiences.

What's in store for the future?

Quantum computing is poised to become a ubiquitous element in the computational stack of the creative industries, revolutionising not only music but also gaming, film, and other forms of digital art. This transformation will redefine the boundaries of creativity and technological innovation.

In the gaming sector, quantum technology promises to dramatically enhance procedural generation techniques. Quantum computers' unique ability to factor large numbers and generate truly random values will enable the creation of vast, diverse game worlds with unprecedented levels of detail and unpredictability. This could lead to infinitely varied and non-repeating game environments, characters, and scenarios, offering players genuinely unique experiences every time they engage with a game.

In the realm of music, quantum technologies are showing significant promise. The quantum approaches to generative music technologies that we are working on are set to become powerful tools for creating and manipulating sound. These quantum-enhanced systems can learn complex musical structures from existing compositions and generate

entirely new pieces, without suffering from the computational demands or copyright issues of existing generative AIs. This opens up unprecedented possibilities for AI-assisted composition and real-time music generation.

The integration of quantum computing into the creative industries' tech stack isn't just about enhancing existing processes – it's about unlocking entirely new forms of creativity. As quantum technologies mature, we anticipate a paradigm shift in how digital content is created, distributed, and experienced.

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

If you're starting a company in the quantum computing space, don't use the letter Q in your name.

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

I have a fairly normal day and am incredibly lucky to come into an office in the vibrant and creative community of Somerset House in London. My day is split fairly evenly between research and development roadmaps, creative projects with artists using quantum, and finance & operations. In terms of rules, I try not to be too dogmatic and take it one day at a time, using common sense but of course embracing a bit of the madness that comes with an early stage company.

Ferdinand Tomassini is the CEO and cofounder of _Moth Quantum_.

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