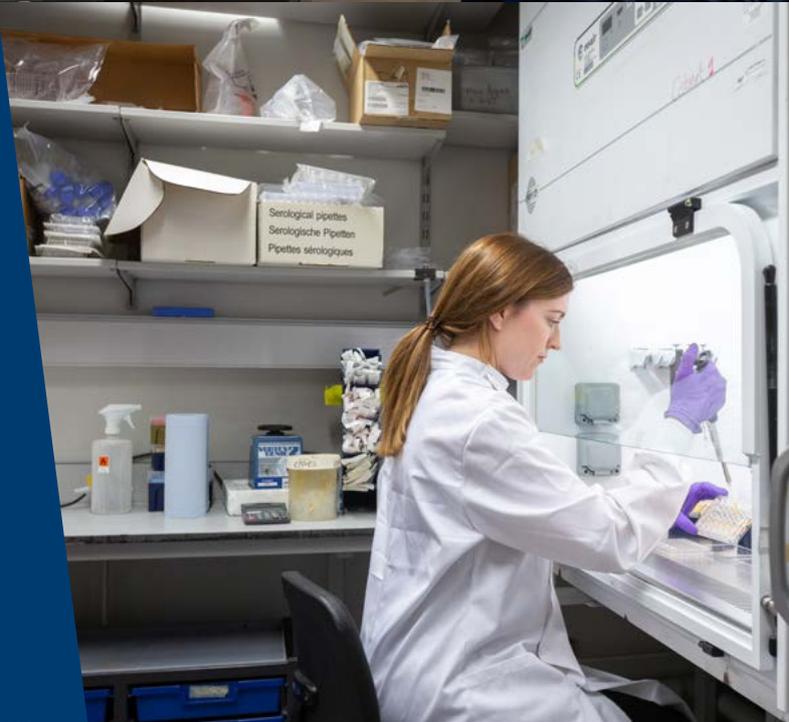


Imperial College  
London



# Startup investment pitch event

THURSDAY 14 MAY 2020



Meet some of Imperial's most innovative entrepreneurs, their ideas, technologies and companies.



## EVENT PROGRAMME

9:45 am	<b>Event start (Holding video)</b>
10:00 am	<b>Event begins - running order:</b>  <b>Welcome from Dr Govind Pindoria</b>  Zyme Biosciences <b>Introduction to Entrepreneurship at Imperial (Dr Govind Pindoria)</b>  earwig FuroSystems ApTap <b>Entrepreneurial support (Ben Mumby-Croft)</b>  Bumblebee Power Deepfinity DASH <b>Investment opportunities (Brijesh Roy)</b>  Neoptera Surgical Quaír Third eye intelligence hydroCotton <b>Imperial Innovation Fund (Parwalk Advisors)</b> <b>Closing remarks (Dr Govind Pindoria)</b>
11:00 am	<b>Event closes</b>

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## COMPANIES

### **ApTap**

White-labelled financial management APIs that allow banks to offer bill management tools to their customers.

### **Bumblebee Power**

Large airgap and misalignment tolerant wireless charging solution for the mid-power lightweight micro-mobility market.

### **DASH**

Micro-mobility-as-a-service for businesses and their employees.

### **Deepfinity**

Parcel Tracker™ – an internal parcel management application for building.

### **Donaco**

Donaco is a purpose-driven company building an AI-powered fundraising solution to accelerate digital adoption by the non-profit sector.

### **earwig**

A labour marketplace for the construction industry based on workers' reviews.

### **FuroSystems**

An engineering and product design company for personal e-mobility.

### **hydroCotton**

Data-driven agriculture and controlled environments to grow radically more sustainable and transparent cotton.

### **Micrographia Bio**

Engineering the chemical atlas for modern drug discovery: a platform drug discovery company.

### **Neoptera Surgical**

MedTech startup developing precision A.I.-supported robotic surgery for minimally invasive diagnostics and therapy.

### **Quaísr**

Cloud native simulation and machine learning tool with uncertainty quantification for engineers.

### **Third Eye Intelligence**

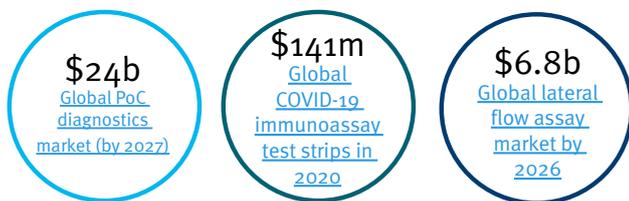
An evolving A.I. system for predicting the risk of multi-organ failure.

### **Zyme Biosciences**

The QuickZyme rapid point of care test for early COVID-19 detection.

Zyme Biosciences will be a point-of-care diagnostics company that develops, manufactures, and markets a rapid, ultrasensitive, affordable, and accurate point-of-care diagnostic test for COVID-19, based on its QwikZyme platform, enabling much earlier diagnosis.

**MARKET**



**OPPORTUNITY**

According to the WHO, there are now more than 3.4 million confirmed COVID-19 cases in 187 countries, and at least 239,000 deaths from the virus. Without therapeutics or vaccines, containment of the disease by rapid screening is crucial. Current COVID-19 diagnosis involves PCR, requiring highly trained personnel, equipment, and long assay times (typically 24 hours between sampling and patient feedback). Point-of-care (PoC) serological tests for patient immune responses have been developed but cannot detect the virus until up to 10 days after symptom onset.

Our PoC diagnostic device, is based on our proven (for HIV) QwikZyme platform. Uniquely, it is designed to detect ultra-low concentrations of the COVID-19 virus itself, very early in the infection, in an easy 15-minute readout time. Beyond HIV and COVID-19, our QwikZyme platform shows promise for ovarian cancer, cardiac, malaria, and other diseases.

**BUSINESS STRATEGY**

Due to the low cost and requirements of our technology, it can ultimately be sold and used in a wide range of segments outside of hospitals, including GPs, and care homes in low income countries as well.

With our early testing, we can also enable healthcare frontline workers to self-test and only self-isolate if they are actually infected, thus overcoming staff shortage.

One of our first customers will be Imperial College Healthcare NHS Trust hospitals. We plan to expand by working with distribution partners, and price our test strips at £2-3 per test strip and adopt a differential pricing model depending on the income of the countries.

We have the capability to produce at least 100k GMP compliant test strips every 4-5 days, via an experienced contract manufacturer, which we aim to replicate in regional manufacturing sites around the globe.

**NEW COMMERCIAL HIRES**

Experienced leadership team: CEO, CMO, COO  
Engineering, regulatory, operations and marketing team

<b>£7-10m</b>	<p>To build new team (see new hires) July 2020 - Jan 2021; Scale-up manufacturing of GMP compliant devices with Abingdon Health (100k devices in 4-5 days) and other contract manufacturers as well as <i>in vitro</i> diagnostics designers - October 2020; Complete clinical trial and obtain CE marking (MHRA IVD medical device directive) November 2020</p>
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**KEY ACHIEVEMENTS**

- Awarded EIT Health COVID-19 funding (€600k), EPSRC i-sense COVID-19 funding (£100k), and Imperial College COVID-19 Rapid Response Call funding (£50k) to support the development of our QwikZyme prototype, up-scaled GMP manufacturing, and initial clinical validation studies together with Imperial College Healthcare NHS Trust hospitals.
- Technology platform validated for HIV.
- QwikZyme platform is based on peer-reviewed technology.
- Supporting key publications:
  - ACS Nano 2018, Loynachan, Stevens.
  - Nature 2019, Wood, Stevens.
  - Nature Nanotechnology 2019, Loynachan, Stevens.
  - ACS Nano 2018, Brangel, Stevens.
  - Science 2014, Howes, Stevens.
  - Nature Nanotechnology 2012, de la Rica, Stevens.
  - Nature Materials 2012, Lorenzo, Stevens

**TEAM**

**Professor Molly Stevens FEng FRS, acting CSO and Chair of Advisory Board**

- Professor of Biomedical Materials and Regenerative Medicine at Imperial College London ([www.stevensgroup.org](http://www.stevensgroup.org)).
- Deputy Director of i-sense ([i-sense.org.uk](http://i-sense.org.uk))
- Prof. Stevens' research has been recognised by over 30 international awards.

**Dr. Marta Broto Aviles, Advisory Board**

- Postdoctoral Research Associate in the Stevens Group leading the development of QwikZyme and developing particle-based diagnostic devices and surface biofunctionalisation strategies.
- PhD in multiplexed and multimodal diagnostic platforms in nanobiotechnology for diagnostics group at the University of Barcelona.

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# Earwig



earwig is a labour marketplace illuminating the multi-tiered and opaque hiring process in the trillion-dollar construction sector. We help workers find the best jobs and share detailed knowledge while enabling companies to effectively audit their whole supply chain and reduce worker-churn that currently costs them millions of pounds annually.

## MARKET



## OPPORTUNITY

Construction is broken. The trillion-dollar sector is fragmented into cascading supply chains with poor transparency. On a single worksite, major contractors manage 70+ subcontractors that use agencies to recruit tradespeople on temporary contracts.

As a result, workers never know what jobs they are getting into before arriving on-site and they have little power to effect change. Contractors are also hurt by the *status quo*. Millions of pounds are lost on ‘worker churn’ and contractors have no consistent form of feedback from workers about why churn is happening.

There’s a huge opportunity to bring order to this chaos and to empower both tradespeople and contractors with the information they need to thrive

## BUSINESS STRATEGY

Connected for the first time, tradespeople publish reviews for free and are incentivised to return to the platform by detailed information on worksites as well as job boards and rewards for helping each other (via tools and training).

For a subscription, companies claim their profiles and access these crucial worker-led insights. This data allows contractors to benchmark themselves against their competitors and effectively monitor the whole supply chain on each site. By identifying underperforming subcontractors and agencies, contractors can reduce worker churn, attract and retain the best talent, and deliver projects on time and on budget.

Additionally, earwig provides agencies with a concentrated pool of talented tradespeople. This enables them to target their job searches more effectively and allows the best agencies to stand out from the crowd of over 1,500 agencies competing for the same talent.

## FUNDING REQUIREMENTS

<b>£400k Funding</b>	<b>Product &amp; Team (60%)</b> <ul style="list-style-type: none"><li>- Building commercial team</li><li>- Developing contractor side of platform</li></ul>
	<b>Customer Acquisition (30%)</b> <ul style="list-style-type: none"><li>- Referral incentives</li><li>- Marketing content creation</li></ul>
	<b>Fixed Costs (10%)</b> <ul style="list-style-type: none"><li>- Technical infrastructure</li><li>- Accounting &amp; legal</li></ul>

## KEY ACHIEVEMENTS

- Paid pilots with Willmott Dixon and Skanska – two of the UK’s largest contractors
- Considerate Constructor Scheme’s ‘data point’ of choice to demonstrate worker welfare on sites
- 55+ hours of user testing completed and launched MVP
- Validated by Bethnal Green Ventures, Resolution Foundation and InnovationRCA
- Winner of ‘Our Place in the World Prize’ & awarded £5k grant from UnLtd
- Advisory board includes Glassdoor’s first international employee, Founder of G2 Crowd (world’s largest software reviews site) and CEO of Considerate Constructors Scheme

## TEAM

### Harrison Moore, CEO

- 15 years’ experience as an electrician
- Self-funded through two of the world’s top art schools while a temporary worker

### Pontus Denlew, COO

- MSc Finance & Accounting (Imperial)
- 7+ years’ experience in law, finance and tech. Spent past three years in M&A at Nomura Investment Bank

### Joe Friel

- Full-stack developer
- Joe & Yalla Collective support earwig until CTO is recruited (in progress)

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[www.earwigwork.com](http://www.earwigwork.com)

## FuroSystems

FuroSystems is an engineering and product design company focusing on developing unique e-bikes and e-scooters with a focus on performance and minimizing manufacturing costs.

### MARKET



### OPPORTUNITY

Urban congestion is reaching a breaking point. Cities are more congested than ever before, cars in central London travel at an average of just 11.8km/h. 54% of air pollution in our cities are caused by traffic endangering our health and wellbeing.

e-Bikes and e-Scooters are hands down the best solutions to Urban mobility. They are the fastest, cheapest, healthiest, most efficient and easiest to use mode of transport. The industry is growing extremely fast and is expected to exceed 6B £ in Europe by 2022.

FuroSystems is a direct to consumer digital brand for elegant and high performing electric vehicles. The company's goal is to revolutionise Urban mobility through software connected beautifully designed products with a direct to consumer approach.

### BUSINESS STRATEGY

We are a digitally native direct to consumer brand. We reach customers primarily through our online platform. Our D2C approach allows us to have full control of the relationship between our customers and ourselves. Our strategy has seen significant success with 312% yearly growth and revenues of £748,000 in 2019. Since inception, we have delivered over 850 e-Bikes and e-Scooters.

Our growth is fuelled by our digital marketing engine where we built proprietary algorithms to track and target customers and significantly boosting our conversion rates.

Today, we market 4 products (with 2 more in the pipeline), are entirely self-funded and profitable. We built a very strong business model in an industry that is rapidly growing, and now is the time for us to scale

### FUNDING REQUIREMENTS

**£500k**

To launch two new proprietary products, increase our working capital, and expand our team to achieve £3.6m in sales in 2021

### KEY ACHIEVEMENTS

- Already delivered over 850 high-end electric bikes and scooters
- Revenues of £748,000 in 2019
- 312% YoY sales growth between 2018 and 2019
- One of the highest customer satisfaction in the industry with 5\* on Trustpilot
- Established a scalable business model with no external funding

### TEAM

#### Elliott Wetheimer, CEO

- Skilled in web design, sales and marketing
- Focuses on the core growth of the company as well as business development

#### Albert Nassar, CTO

- Extensive experience in manufacturing with expertise in product design and engineering
- Handles entire manufacturing logistics and supply chain

#### Guillaume Chichmanov, CMO

- Digital marketing expert with professional experience as an account director at Publicis
- In charge of social media and online marketing

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## ApTap

At ApTap we are building white-labelled financial management APIs that allow banks to offer bill management tools to their customers. ApTap is a next generation affiliate marketplace, that allows banking customers to cancel, compare, switch or sign up to services all within their banking app.



### MARKET



### OPPORTUNITY

The average UK consumer could be saving >£500/year every year by switching their energy and broadband providers. But takes too much effort and they are wasting time trying to cancel, switch or sign up on separate websites.

Banks have increased competition from the Challengers/FinTechs which means decreased engagement, therefore not maximizing revenue potential and cutting into bottom line.

Also, brands lack new channels into customers and data insights. Therefore, have poor user experience, not optimising offerings and have low conversion rates.

We automatically identify bills, build user profiles and compare deals, allowing users to cancel, switch or sign up instantly, within their banking app.

The simple user experience re-engages customers to banking app by providing personalised product offerings, while adding new revenue streams that is not linked interest rate and upselling opportunities. Richer market insights and higher conversion rates through new digital channels for the brands.

### BUSINESS STRATEGY

By allowing banks to offer these tools, we are changing how customers perceive their bank, helping the bank become the trusted advisor or deal broker on behalf of their users.

Our business model is proven and scalable based on Software licensing fee and Affiliate commission. We charge a bank software licensing fee tiered by the number of active users and API calls. Every time we switch or sign up a user to a new service provider, we generate affiliate commission and revenue share between the bank and ApTap. For example, average affiliate commission on broadband switch is = £40-120 per product and only 12% of UK population switch every year.

Therefore, we are targeting to generate £1M ARR by the end of fiscal year through both revenue stream with banking and FinTech integration as well as revenue generated through D2C web-app.

### FUNDING REQUIREMENTS

<b>£500k</b>	<ul style="list-style-type: none"><li>Hiring tech team - full stack developer (x2) and data scientist (x2)</li><li>Product - expanding APIs to mobile phone industry and digital subscriptions</li><li>Pilot - run and operate proof-of-concept and integrations with banks and FinTechs. This will allow us to roll onto a full contract and integration with 5m customers</li></ul>
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### KEY ACHIEVEMENTS

- £300k last year with three Angel investors
- Lined up a paid pilot with a major British bank, starting in June, with a view to roll onto a full contract;
- D2C Web-app launched in May over to 700 people on our mailing list, gathered organically;
- 100% coverage of Energy sector through partnership with EnergyLinX (GoCompare);
- 90% coverage of Broadband markets through affiliate partnership with SKY, BT, EE, Virgin, etc.
- Partnerships with 2 smaller FinTechs verbally agreed, technical integrations to begin in July;
- We took part in 2 accelerator programs which have put us directly in front of over 50 financial institutions in the UK - Accenture's FinTech Innovation Lab (top 10 startup) and WeWork Labs by TSB Labs.

### TEAM

#### Nadal Sarkytbayev

Co-Founder & CEO - Funding and Hiring

#### Will Billingsley

Co-Founder & CCO- Sales and Partnerships

#### Isa Ibrahim

Co-Founder & CTO - Architecture and Data Science

#### Cagdas Timurlenk

Head Developer – Enterprise Technology

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[www.aptap.co.uk](http://www.aptap.co.uk)

## Bumblebee Power



The wireless power solution taking flight from Imperial College London, bringing a unique, patented, ground-breaking technology enabling efficient power transfer for e-bikes, electric scooters, drones, autonomous systems, factory automation and much more.

### MARKET



### OPPORTUNITY

Bumblebee will transform the rapidly growing electric micro-mobility and autonomous systems markets, removing their reliance on battery-swapping and cable-based charging with a wireless solution that has first-mover advantage and perfect technology fit.

Existing wireless power technologies require precise positioning and ferrite materials which are expensive and heavy. Bumblebee can achieve:

- three times the wireless range
- three times the tolerance to misalignment
- less than 1/10th the weight

With established customer demand and the opportunity to become the standard in several commercial and industrial applications, Bumblebee will firstly target wireless charging of urban e-bike hire schemes, with a near-term opportunity of £150m sales in a market forecast to spend £140bn on battery charging by 2030.

### BUSINESS MODEL

A charging solution consists of a charging pad, and a receiver integrated into a battery-powered device, with value-add features available such as foreign-object detection, power-level monitoring, battery optimisation and device data capture.

In urban e-bike hire schemes, wireless charging can save 50% vs existing battery-swapping operations with pricing of a charging solution at around ~£1k per bike pa, and wider convenience benefits.

Bumblebee is lining up a first gateway customer in Pashley Cycles, who supply the London Santander cycle hire scheme. Trials are in-plan for wireless charging in their new e-bike schemes which will roll out across UK cities from 2021.

Longer term, Bumblebee will distribute charging solutions both OEM with device manufacturers and as retrofit kits where appropriate, with charging pads sold both as part of an integrated solution and also direct to end-users.

### FUNDING REQUIREMENTS

<b>£600k</b>	Seed funding, to obtain product certification, protect IP assets, run trials with gateway customer Pashley and sign the first sales order.
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### KEY ACHIEVEMENTS

- £5m research funding raised to develop the underlying technology, £200k Impact Acceleration to develop scooter and drone charging prototypes and £80k of grant funding to run trials for e-bike charging
- Successful working prototypes developed with Govacs (e-scooter), Thales (surveillance drone) and Casta Spes (ground surveillance robot)
- Collaborations and discussions ongoing with several further partners including Deliveroo (e-scooter fleet charging), Elmovo (e-scooter hire) and Pashley Cycles (e-bike hire)
- Team and technology featured on BBC Click

### TEAM

#### Dr David Yates | CEO/CTO

Leading business strategy and product design, the driving force behind developing the technology for commercial application

#### Zac Hinton | CCO

Leading commercial operations, with experience co-founding, scaling up and raising capital for start-ups and running operations for a multi-million technology consultancy

#### Prof Paul Mitcheson | CSO

Director of Imperial's Wireless Power Lab and chair of the Wireless Power Week conference, leading R&D for Bumblebee

#### Strategy & Advisory

Brian Graves, former MD of Imperial Innovations  
Alex Caccia, CEO of Animal Dynamics

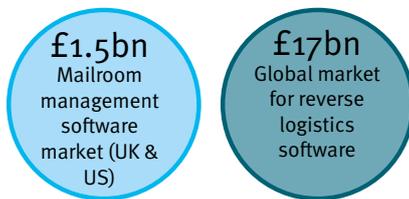
[david@bumblebeepower.com](mailto:david@bumblebeepower.com)  
[www.bumblebeepower.com](http://www.bumblebeepower.com)

## Deepfinity

E-commerce is growing 19% YoY. Building managers cannot handle this volume of parcel deliveries. Parcel Tracker™, an internal parcel management platform is now solving this problem.



### MARKET



### OPPORTUNITY

Online shopping has been growing 19% year-on-year since 2014. Between 2018 and 2025, the number of delivered parcels is predicted to increase from 85 Billion to over 200 Billion. The trend will continue to grow as online-shopping has only achieved 15% market penetration as a percentage of all retail.

Due to the increase in deliveries, building managers are struggling to manage volume of parcels arriving at their buildings. Symptomatic of this delivery increase are the loss of parcels and the exorbitant amounts of time reception and mailroom staff spend daily managing parcels.

Parcel Tracker™ is an internal parcel management application that digitises the manual process of logging all deliveries into the building. Parcel Tracker™ is used by front-of-house staff (receptionist) and the mailroom/logistics bay teams. This saves building managers over 70% of time dealing with packages, reduces the number of lost parcels and improves resident satisfaction.

### BUSINESS MODEL

Deepfinity provides Parcel Tracker™ as a SaaS to building managers and building owners, and charge between £500-2500 per building per year.

Deepfinity's initial target market includes Student Housing, Co-living, Built-to-Rent, Co-working, and Office buildings. Parcel Tracker™ is currently in active use across 4 countries, in 32 buildings with 30,000 parcels scanned monthly.

Currently Deepfinity is focused on sales through outbound sales, PPC advertising and organic search. Upon reaching a critical mass of clients, this user base will be leveraged to launch a reverse logistics product allowing residents to return online shopping straight from the reception.

### FUNDING REQUIREMENTS

<b>£250k</b>	<p>To hire team including co-founders to go full time, web developer, sales development, account executive and growth hacker.</p> <p>Goals:</p> <ul style="list-style-type: none"><li>Reach £1m in revenue with 2000 buildings</li><li>Launch pilot for returns product</li><li>Build up indirect sales channels</li></ul>
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### KEY ACHIEVEMENTS

- Scalable product launched
  - Android application
  - Web app
  - iOS in alpha launch
- £32,000 annual recurring revenue
- 40,000 parcels scanned monthly
- 15,000 residents served by parcel tracker
- £35,000 in April 2020

### TEAM

#### Arthur Zargaryan, CEO

- Kings College London, BSc in Computer Science First Class
- Imperial College London, MSC in Bio Engineering, First Class
- Built and sold education company in first year of uni

#### Luca Mozzo, CTO

- Kings College London, BSc in Computer Science with Intelligent system, valedictorian in his course.
- Software Engineer as Babylon health, a scale up now valued at over £2 Billion.

#### Alan Abdo - Head of Engineering

- Kings College London, BSc in Computer Science, First Class
- Built Crypto-currency portfolio application winning the Allesch-Taylor Scholarship.
- Android Developer at Tandem Money (A challenger bank)

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[www.parceltracker.com](http://www.parceltracker.com)

## DASH



DASH enables businesses to harness micro-mobility technologies in a way that benefits the environment, employee well-being and the company bottom line. We provide e-bikes as a service offering all the user-benefits without any of the headaches of ownership.

### MARKET



### OPPORTUNITY

Businesses waste time and money moving people over short distances.

Businesses are also under increasing pressure to embrace sustainability, but often see this as a direct trade-off with profitability.

Work-related travel (both commuting and intra-business) accounts for over one-third of total UK CO<sub>2</sub> emissions from passenger transport.

Examples include tech firms using taxis for short cross-city journeys or private land customers who need to move employees across private land. These inefficient modes of transport also have an impact on employee physical and mental health and wellbeing.

COVID-19 provides a unique opportunity as businesses are looking to get employees back into the office, but do not want to expose them to the risks of public transport.

### BUSINESS STRATEGY

DASH is a sustainable micro-mobility venture, one which benefits cities and their inhabitants. We offer a B2B subscription e-bike service that enables businesses to address sustainability, while maintaining profitability. Our business model allows us to reach profitability with significantly less capital than existing micro-mobility firms.

DASH provides mobility-as-service to businesses including customer branded vehicles and helmets; repairs and maintenance support, user and third-party insurance cover, carbon offsetting of electricity usage making the vehicles truly emission-free. In the future, we will provide a white label app and dashboard alongside automated storage lockers. While our initial product offering utilises e-bikes, we see a growing market in the future for other forms of micro-mobility such as e-scooters.

Our pricing, as low as £2.75 per day per vehicle, helps our customers to deliver on the triple bottom line of people, profit and planet.

### FUNDING REQUIREMENTS

<b>£250k</b>	SEIS/EIS eligible investment. This investment will complement a number of grant-funding opportunities the business is pursuing, with more grant opportunities becoming available month by month. If the existing proposals are secured, up to £25,000 of the investment will go into developing our IoT integration mobile app and cloud-based dashboard. The funds raised will enable us to hire two dedicated sales personnel and one operational hire, providing the capacity to grow and effectively service over £250k in annualised recurring revenues within the next 12 months
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### KEY ACHIEVEMENTS

- Successful trial with a multi-national logistics firm in Southampton
- Established bespoke insurance product in collaboration with insurtech firm
- Only UK preferred supplier of RadPower bikes
- COVID-19 response: in partnership with Brompton Bicycles, we provided the Imperial College Vaccine team with folding bikes.

### TEAM

#### Jamie Milroy, CEO and Founder

Chartered accountant, former manager at PwC, finance mentor to two startups and member of the All Party Parliamentary Climate Change Group

#### David Watkins, Founder

Chartered engineer, former manager at Jaguar Land Rover and Imperial College MBA

#### Roddy Graham, Advisor

Serial investor and entrepreneur. Former commercial director and early stage investor in one of the UK's largest car leasing companies.

#### Clive Jackson, Advisor

Serial entrepreneur and 7-time entrant into the Sunday Times Tech Track 100.

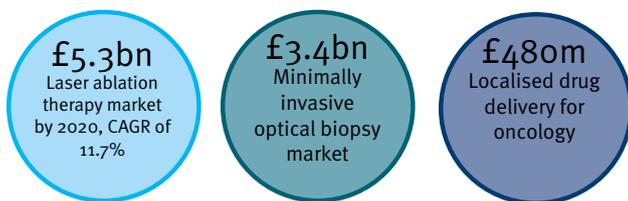
[jamie@dashrides.com](mailto:jamie@dashrides.com)  
[www.dashrides.com](http://www.dashrides.com)

## Neoptera Surgical

Neoptera Surgical specializes in precision robotic surgery for minimally invasive diagnostics and therapy, bolstered by proprietary bio-inspired technology



### MARKET



### OPPORTUNITY

Worldwide, around 13 million patients with focal refractory epilepsy are suitable candidates for Laser Interstitial Thermal Therapy (LiTT) but are not treated due to limitations of current technology available. Currently, multiple insertions may be needed to cover the ablation volume, meaning higher consumable costs, operating time, and the risk of follow-on surgery if tissue is left behind. Neoptera Surgical will enable all such patients to be treated surgically, which in the UK we estimate to be up to the 20% of the entire epilepsy population. Neoptera Surgical provides a minimally invasive, steerable catheter driven by an AI-supported robotic system. The robotic system will enable surgeons to follow optimal curved paths to reach any target in the brain. Our technology requires a single insertion, reducing total healthcare pathway costs, and can be extended to treat liver cancer, brain lesions and soft tissue tumors.

### BUSINESS STRATEGY

Our system is an extension to existing commercial LiTT systems.

Our business development plan involves a B2B market strategy similar to ClearPoint Neuro, after our first-in-man milestone and further de-risking of the system are achieved. Revenue will be generated from sale of capital equipment, with recurring revenues from our proprietary catheter consumables, service contracts, training, data management and consultancy on complex procedures.

We are currently engaging with Medtronic Inc as a potential research partner toward CE marking of the Neoptera technology.

### FUNDING REQUIREMENTS

<b>£2.2m</b>	For company formation and commercial team development (6 staff); Catheter and software optimisation for thermal therapy; Quality Management System setup; Certification advisory
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### KEY ACHIEVEMENTS

Within the context of an EU project, we have developed a pre-commercial robotic ecosystem featuring a planning and navigation software, a sterilisable robotic platform, a medical-grade steerable catheter for neuro-oncological application of precise drug delivery.

The system is currently used for pre-clinical, in-vivo study on an animal model. We have an international granted patent regarding the catheter technology WO2011064602A1

We have secured around £107,000 of equity-free funding through two start-up programmes and over 10 €million in public research funding.

### TEAM

#### Dr Riccardo Secoli

Medical Robotics engineer with more than 10 years of experience in surgical and rehabilitation robotics. He is the designer of the control of the steerable catheter. He is currently doing an online Executive MBA.

#### Ms Marlene Pinzi

PhD candidate, with a biomedical engineering background on imaging analysis. She is the “mind” behind the surgical planning for the steerable catheter.

#### Prof Ferdinando Rodriguez y Baena

Professor in Medical Robotics at Imperial College London, with more than 15 years of experience in research and commercialization of surgical devices. Original inventor of the Mako robot of Stryker.

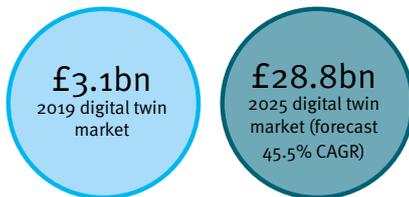
[rsecoli@neopterasurgical.com](mailto:rsecoli@neopterasurgical.com)  
[www.neopterasurgical.com](http://www.neopterasurgical.com)

# Quaísr

Cloud-native platform. Simulation and machine learning with uncertainty quantification.



## MARKET



## OPPORTUNITY

Advances in machine learning are enabling new technologies and driving the fourth industrial revolution. Opportunities have been created for smart manufacturing, innovative design, digital twinning and disruptive approaches in multiple industries: remaining competitive requires a fundamental shift in the engineering mindset towards agile, cost effective, iterative and rapid solution design.

Our focus is on engineering, in the widest sense, where the common theme is that established industries, and the major players within them, are struggling to pivot onto the enabling tools of data science, machine learning and DevOps that are currently beyond the skillset of practicing engineers. There is a disconnect between the rapid evolution of these tools in technology companies and their wide adoption in traditional engineering. We will create the standard-setting platform, Quaísr, and place tooling in the hands of engineers, so that they are limited only by their creativity.

## BUSINESS MODEL

Our business model has two parallel revenue streams based on a verticals model, providing a scalable structure replicable across domain areas:

- Platform subscription tier: Multi-app subscriptions (per-app pricing) targeted at multinational organisations
- App subscription tier: Single-app subscriptions (per-user pricing) targeted at individuals and smaller enterprises (SMEs)

We have delivered a minimal viable product (MVP) and validated with a small paid pilot start up. We are currently piloting digital-twinning industrial applications with multinational organisations in two distinct sectors: manufacturing and energy. The sectors have been chosen based on market size, together with the prior expertise and contacts of our founding team. In addition to the existing pilots we anticipate new revenue streams to be created from the end of the first year of operation (Q1 2021).

## FUNDING REQUIREMENTS

<b>£700k</b>	Completion of first platform vertical. Staff recruitment for software engineering and sales. Office/incubator workspace. Demonstration of scalability. The funding will sustain Quaísr for two years until subsequent Series A raise of £3m.
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## KEY ACHIEVEMENTS

- Completion of minimal viable product (MVP) in 18 months.
- Secured paid pilot study with multinational organisation in the manufacturing sector. Second pilot study is currently being finalised with a multinational client in the energy sector.
- Assembled founding team with technical expertise in cloud-native development and streaming analytics.
- Established revenue sharing clauses for joint IP between Imperial College London and the Alan Turing Institute.
- Presented technical vision at the CogX Festival of AI and Emerging Technology, London, 2019.

## TEAM

### Omar Matar, CEO

Vice Dean Faculty of Engineering at Imperial. Has led multiple large EPSRC platform grants (>£30M+) with multinational industry partners.

### Richard Craster, COO

Dean Faculty of Natural Sciences at Imperial. Has managed large technical teams as former head of department. Responsible for Quaísr financial and operational aspects.

### Ashley Unitt, Chairman

Has extensive commercial experience, NewVoiceMedia sold for US \$350M (2018). Responsible for Quaísr commercial strategy.

### Lachlan Mason, CTO

Group Leader Data-centric Engineering at The Alan Turing Institute (ATI). Experienced full-stack developer, PhD in engineering. Responsible for Quaísr technical development and operation.

### Indranil Pan (CSO)

ICRF, Group Leader Data-centric Engineering at Imperial/ATI. Experienced industrial data scientist, PhD in engineering. Responsible for Quaísr data-science and uncertainty-quantification aspects.

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## Third Eye Intelligence

Powered by AI, Third Eye gives doctors at Intensive Care Units the most valuable commodity – time. Currently, doctors are ill-equipped to analyse the deluge of patient data within a short timeframe. By predicting the risk of organ failure, we will enable targeted treatment planning, efficient resource utilisation, and higher survival rate in hospitals.



### MARKET



### OPPORTUNITY

In intensive care units (ICUs), doctors are forced to make life-or-death decisions in a time-critical setting. They have to retain and analyse mounds of information, using outdated systems to assess well-being. This is fraught with the potential for human error, leading to delayed detection and treatment which often ends in fatalities. With more than 45% of adverse events in the ICUs being preventable, and at a mortality rate of 53%, clearly the current solutions don't allow for deep analysis of the patient's condition.

Powered by AI, Third Eye gives doctors the most valuable commodity - time. We developed a tool that forecasts clinical deterioration of the patient's condition across multiple parameters, providing an early warning system for doctors. Based on all available electronic patient data, our AI generates a score that indicates overall risk of deterioration and triages patients accordingly. Currently, our model is able to predict critical events related to kidney-, lung-, heart-failure and sepsis with a median of 36 hours before disease onset (95% confidence interval).

### BUSINESS MODEL

We are in talks with EHR vendors to be able to deploy our system onto their hospital infrastructure, who will be compensating us for our software as a service on a tier-based model. Our product will be launched in UK institutional hospitals, but due to a higher degree of digital maturity and a larger market, we will be striving for fast deployment in the US. There, we will be expanding our business model to cater to insurance claims and justification, adding more advanced features to the system.

We have developed a proven model and AI system. Our lab validated technology is trained on the largest available hospital datasets and ready to be validated in a relevant hospital environment. We are in the process of hiring additional engineers to develop hospital back-end integration and a create an accessible front-end for an MVP launch within 6-8 months. After completion, we will conduct alpha and beta testing for certification in partnership with Imperial NHS trust (12-24 months).

### FUNDING REQUIREMENTS

<b>£350k</b>	June 2020: AI infrastructure July 2020: 2-3 engineers (AI research, back-end, front-end) July - January 2021: Data-licensing agreements and alpha testing
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### KEY ACHIEVEMENTS

- Spoken to over 40 intensive care doctors worldwide to understand the scope and size of the problem
- Attained the largest hospital dataset form MIT-LCP labs to train, validate & test our AI model
- Won the Imperial College Venture Catalyst Challenge Heats, AI & robotics track sponsored by Amazon Robotics
- Invited to Global Grad Show 2020 (grant provided by Government of Dubai)
- Collaboration with IBM & Phillips industry partners for further development & improvement of the product
- In talks with major Electronic Health Record vendors

### TEAM

#### **Samyakh Tukra, Founder, CEO & CTO**

PhD in Evolutionary AI & Computer Vision applied in advanced surgical robotics @ Hamlyn Centre.

#### **Marta Kedrzycki: Clinical Consultant, Product Development**

PhD in Fluorescence Guided Surgery, MRCS, MSC Surgeon, Healthcare Design GTA

#### **Tom Gouder: Developer Operations Engineer**

Backend Developer: RakeTech Group;  
Senior Systems Architect: Innovatiq

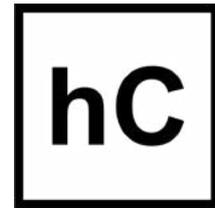
#### **Luca Meise: Business Development**

MSc Innovation & Management Imperial College; MSc Chemistry/ Physics

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## hydroCotton

We help fashion companies reduce their environmental impact using precision agriculture and controlled environments to grow radically more sustainable cotton in a transparent way.



### MARKET.



### OPPORTUNITY

Cotton is the most widely used natural fibre in the fashion industry, regarded as one of the world's thirstiest and dirtiest crops. Demand for cotton fibre is increasing and there are presently no sustainable ways to produce it - a problem compounded by water scarcity which will directly affect 2/3 of the world's population by 2025.

Initiatives such as the UN fashion charter and shifting consumer demand are driving the industry to find sustainable innovations to produce cleaner cotton, fashion's most essential natural fibre.

hydroCotton uses data-driven agriculture and controlled environments to grow more sustainable cotton. The same data provides live sustainable verification of the industry's supply chain for farmers and fashion companies. In 2019 we grew 80 cotton plants pesticide-free, with up to 80% less water and fertiliser combined with a 2-3x increase in yield. This year we will grow 400, enough for 50-100 T-shirts.

### BUSINESS STRATEGY

Our strategy has two phases: proving market demand followed by scale up.

Our initial business model will be straightforward. We will own our farms, gin and then sell cotton lint and its by-products.

To guarantee sales we will work on contracts with fashion companies and their preferred mills, helping them shore up their supply chain. We will begin selling high value cotton at 5-10% increased market price to offset initially high costs at small scale.

Once we have proven a sustained and growing market for our cotton, we will license manufacturing of core elements of our growing system and run a hydroCotton trademark in which we will design and co-manage farms digitally. Key partners will be large textile mills and farming organisations to help bring on farmers.

### FUNDING REQUIREMENTS

<b>£300k</b>	Building R&D team, detail design of pilot farm and securing partnership agreement with international fashion brand.
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### KEY ACHIEVEMENTS

#### 2019

- Q3 EIT Climate KIC grant of €25K
- Q3 Successfully grew 80 plants on our test farm reaching sustainable baselines and fibre quality baselines

#### 2020

- Q1 Edward Brial and Edward Hill went full time in February 2020
- Q1 Visited HQ's of 3 international fashion brands discussing pilots
- Q2 Accepted onto Fashion for good accelerator
- Q2 Planted 400 plants at test farm, in contact with 14 brands and 4 mills
- Q2 EIT Climate KIC grant of €20K, London fashion fund £25K innovation loan

### TEAM

#### Edward Brial, CEO

Farm build in Kenya for Drygro, Design Research in Tanzania for Imperial

#### Edward Hill, CTO

Deep experience in clean tech R&D for Entocycle, DryGro and Chip[s] Board

#### John Bertolaso, Design Engineering

Senior design engineer at Random International and Daye

#### John Cappalonga, Horticulturist

22 years' experience hydroponic pepper and chrysanthemum farming

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[www.hydrocotton.tech](http://www.hydrocotton.tech)

## Micrographia Bio

Micrographia Bio is a next-generation life sciences company. Our machine learning (wet lab+dry lab) approach determines the true and total effects of a small molecule compound within human cells.



### MARKET



### OPPORTUNITY & TECHNOLOGY

New medicines development currently takes too long and is too expensive (15+ years and > \$2.6bn per new drug from discovery to patient). 90% of chemical compounds that make it to testing in humans fail to make it through to approval. Often, discovery efforts are hindered by not being able to match the right compound to the right disease.

Micrographia Bio has built an industry-leading computer vision software package for rapid, scalable development of models and analysis pipelines for various types of bio-image analysis. Specifically, this software package gives us the ability to understand changes in cell behaviour in ANY imaging modality. We combine our world-class machine learning algorithms with autonomous microscopy and new advances in molecular biology to map the total effects of a small molecule compound within human cells. This allows us to generate an atlas over time to match the right compound to the disease it is best suited to cure.

### BUSINESS STRATEGY

Micrographia Bio provides a B2B service offering that takes advantage of the world-class machine learning software to help partners discovery new insights in their bioimage experimental data.

We are working with large research institutes and one Top 5 Pharma on applying our technology to accelerate hit-to-lead assistance in drug discovery. In parallel, we are also working with customers to unblock phenotypic assets and help them map their de-convolution of mechanisms of action.

### FUNDING REQUIREMENTS

**£1.25m**

To build out R&D team (molecular biology and microscopy engineer) and laboratory at White City (i-Hub). 18-24 months runway.

### KEY ACHIEVEMENTS

- Over the past 5 months we have completed 7 data-sharing pilots with partners
- We have unblocked one new therapeutic drug discovery program
- Completed pre-seed funding round from Entrepreneur First. £750k committed for Seed round, S/EIS-eligible
- Assembled all-star advisory team of Dr. Annalisa Jenkins (ex Global Head R&D Merck Serono, CEO Dimension Tx), Dr. Tachi Yamada (ex R&D Chair GSK, Gates Foundation, Takeda Pharmaceuticals) and Dr. Alexander Moscho (chief strategy officer UCB).

### TEAM

#### Julia Fan Li, CEO

- PhD Engineering, University of Cambridge, Gates Scholar. Raised and deployed \$108mm Global Health Investment Fund
- Previously SVP & Head of UK for computational company Seven Bridges Genomics (\$50M Series A) and analysis partner to UK Biobank

#### Christopher Thompson, CTO

- > PhD Bacterial pathogenesis, Imperial College, 2X Fellowships. Expert in molecular biology, machine learning and robotics.
- > Previously machine learning engineer at Xihelm, building autonomous robots for greenhouse harvesting.

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## Donaco

Donaco is a purpose-driven company building an AI-powered fundraising solution to accelerate digital adoption by the non-profit sector. Our smart tools have been trusted by leading charities such as Cancer Research UK and UNICEF, while consistently driving an increase in funds to support their vital work.

### MARKET



### OPPORTUNITY

The non-profit sector is struggling to connect with donors online due to changes in demographics and increasingly achieving low ROI across digital channels. Covid-19 has severely impacted charities' ability to generate income, accelerating the need for digital adoption.

Donaco is building an AI-powered B2B platform to automate online donor outreach and amplify impact. This is driven by data intelligence to identify where a potential donor has the original intent to donate. We then automatically place our Smart Units at the right point across the marketing funnel, allowing potential supporters to make instant donations in a frictionless way.

This unique combination gives us a full-funnel view on fundraising and the ability to optimise at every touchpoint, driving up to 30x higher ROI for UNICEF and Depaul UK. In doing so, we are empowering charities of all size with the tools to transition to digital, while amplifying impact where it matters.

### BUSINESS MODEL

Donaco runs managed campaigns on behalf of charities, tapping into their advertising budgets. We charge fixed fees on campaign value (25-35%) and a performance fee on donations.

While doing so, we are gathering unique data on which content, audience and messaging drive conversions for specific causes. This allows us not only to build defensibility but to progressively shift from a service-based to a product-led organisation. In fact, we are using data to train an AI-powered contextual engine, made available via an easy-to-use B2B platform, that would automate the process of fundraising for charities of all size.

In the future, we plan to use the data and behavioural insights gathered in the not-for-profit sector to help the growing ethical brands market connect with consumers in a more meaningful way and drive commerce online.

### FUNDING REQUIREMENTS

<b>£750k</b>	Providing 18 months runway to: <ul style="list-style-type: none"> <li>• Accelerate sales outreach and market entry</li> <li>• Continue building automation using AI</li> <li>• Scale our team to 8 with Machine Learning, Software Engineering and Sales expertise</li> </ul>
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### KEY ACHIEVEMENTS

- **Proven ROI : Delivering value to our clients**
  - UNICEF: 24x increase in donations and 6x improvement in engagement
  - Depaul UK: 5x reduction in acquisition costs and 30x higher ROI
- **Repeat Customers**
  - 100% client retention and trusted by the likes of Cancer Research UK
  - Existing pipeline of leading charities who jointly raise over £750m/year
- **Q-Q Revenue Growth : 1.8x**
  - Q4 2019 Campaign Value: £45k
  - Q1 2020 Campaign Value: £80k

Donaco has secured a £75K pre-seed round of funding in 2018 from angel investors and won several competitions, including the Microsoft Imagine Cup UK.

### TEAM

#### Michael Moses – co-founder & CEO

- Proven track record in not-for-profit sectors & Strong passion for tech for good
- Masters in Electronic Engineering with Management - Imperial College London & EF alumnus

#### Jeffrey Rufus – co-founder & CMO

- Over 16 years of leadership experience in product management and growth roles
- Track record of building and scaling product led business' internationally for Nokia/MSFT and Yahoo!

#### Rik Leigh – Software Development

- 20+ years of commercial experience developing consumer-focused products
- Tech lead and Senior Developer at leading software companies such as Sky and Myriad Group

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[www.donaco.co](http://www.donaco.co)

## THE IMPERIAL INVESTOR NETWORK

Angel and venture investors who join Imperial's Investor Network will be invited to access a data room after the event containing additional content on Imperial startups listed in this booklet.

The data room will be available until 17:00 BST on Wednesday 20 May and will provide the opportunity to book times to follow-up with the start-ups directly.

By signing up to [Imperial's Investor Network](#) you can also receive regular updates from Imperial College's Startup Team

# Enterprise

Imperial College London is a world top ten university with an international reputation for excellence in teaching and research. Located in the heart of London, Imperial is a multidisciplinary space for education, research, translation and commercialisation, harnessing science and innovation to tackle global challenges.

Imperial College London has enterprise in its DNA. Since it was founded in 1907, its mission has been to offer the most advanced education and research, collaborate with other organisations, and apply its work to industry. Today, it has a thriving entrepreneurial ecosystem: a home for businesses, researchers and the next generation of innovators. The Imperial Enterprise Division:

- Helps businesses access the College's resources, talent and expertise to address business and societal challenge
- Supports and encourages staff and student entrepreneurship
- Helps academics find new ways to turn their expertise and research into benefits for society

Since March 2019, the Enterprise Division has assumed responsibility for technology transfer services, including technology licensing and industry partnerships.





## CONTACT

Contact the Startup Team directly:

[startups@imperial.ac.uk](mailto:startups@imperial.ac.uk)

Imperial's White City Campus houses a rapidly expanding entrepreneurial ecosystem. It provides a home for local entrepreneurs, world-leading academics, strategic industrial partners, talented students, and more than 70 companies ranging from startups to corporates.

Left: The Translation & Innovation Hub (I-HUB) provides space for companies to work alongside Imperial researchers and turn scientific and technological innovations into new products and services.

Above: The Imperial College Advanced Hackspace is a unique community of over 2000 like-minded makers, hackers, inventors and entrepreneurs across the University. It is supported by an extensive suite of prototyping equipment and professional experts.

This programme is only being supplied to investment professionals (as that term is defined in article 19(5) of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005 (“FPO”)) or to persons to whom it would otherwise be lawful to distribute it. Accordingly, persons who do not have professional experience in matters relating to investments should not rely on this promotion.

The shares in any of these companies will only be available to an investment professional (as defined above) or a person who has provided written confirmation to the effect that he is an investment professional within the meaning of article 19 of the FPO.