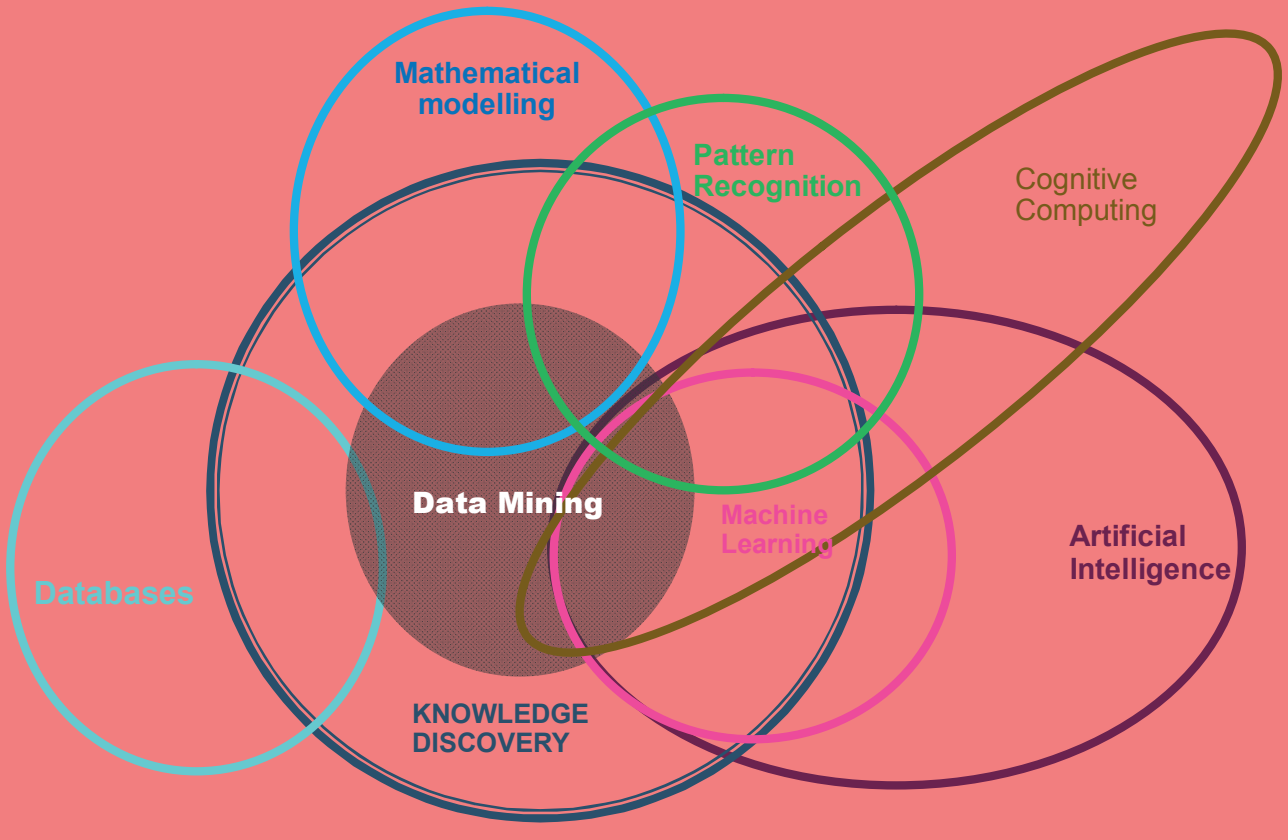
Cyclops Grand Challenge workshop



January 11-12
De Vere Jubilee Conference Centre, Nottingham

Welcome

We are delighted to welcome you to the 2nd Grand Challenge Workshop from the EPSRC-funded Cyclops Healthcare Network, at Nottingham.

Our programme is rich and varied, and encourages interactivity among delegates. In the next two days, you will have intensive discussions about challenges in bringing autonomous treatment solutions to cancer, chronic wounds and critical care. You will have opportunities to discuss your novel ideas and solutions in delivering effective and personalised care to patients.

We hope the workshop will encourage you to form new collaborations and apply for feasibility funding which will help to create new research programmes.

On the first day, you will hear from Professor Niels Peek on how Artificial Intelligence can be used to improve healthcare. You also will hear from speakers from our three clinical areas who will set the scene on current treatment challenges. On day two, you will hear from our current feasibility study grant holders who will tell you about how their projects will help autonomous healthcare.

Thank you for coming, we wish you a stimulating and productive meeting that will make a difference to improving healthcare.

The Cyclops Team

Prof Steve Morgan, Dr Sergiy Korposh, Prof Jon Hardman, Prof Helen Byrne, Prof Declan Bates, Dr Jasmine Harvey.

Contents

Venue Layout

Useful information

Free wi-fi:

To access log in as UoN guest

Complimentary parking:

Remember to complete and leave voucher in your vehicle

Coffee:

Served in the West Atrium during breaks

Lunch and Dinner

Served at the Restaurant

Day 1 Agenda

9.00	**Registration, refreshments, viewing delegate profiles**
10.00	Welcome and opening remarks: Dr Sergiy Korposh, Director of Cyclops Healthcare Network
10.10	Workshop set-up: led by Mr Chris Henderson
10.15	Keynote opening address: Professor Niels Peek: AI in medicine: Where are we now?"
10.45	Meet the table: led by Mr Chris Henderson
11.05	Refreshments
11.20	Setting the clinical scene • Professor Frances Game: *Diabetic Foot Disease; what stops healing?* • Dr Dan Harvey: *Drowning in numbers - Data & Decision Making in the ICU.* • Professor Poulam Patel: *Feedback loops for improving cancer treatment*.
12.30	Lunch
13.30	Interactive sessions 1 & 2: led by Mr Chris Henderson
15.00	Refreshments
15.15	Interactive session 3: led by Mr Chris Henderson
16.30	Exploring new ideas, Q&A: led by Mr Chris Henderson
17.15	Wrapping up day 1 – Professor Steve Morgan: Cyclops Principal Investigator
Evening Programme	
18.00	Drinks reception: Bar area
19.00	Dinner
8.30 (ish)	Mystery entertainment: Professor Todd Landmann, Faculty Pro-Vice-Chancellor, Social Sciences.
21.30 to 2.00	Bar is opened

Day 2 Agenda

10.00	**Arrival, refreshments and networking**
10.25	Welcome back: Professor Steve Morgan: Cyclops Healthcare Network Principal Investigator
10.30	Existing feasibility projects updates • Professor Sergey Piletsky: *Closed loop drug monitoring and delivery in intensive care.* • Prof Cameron Alexander: *"SPI-CLOPS" (Surface Polymer Imprinted Closed Loop Optical Patient Sensors) for Dose Detection and Prevention of Cancer Resistance*. • Prof Jonathan Hardman: *Investigation of closed-loop ventilation strategies for neonatal ICU patients using computational simulation*
11.00	Refreshments
11.15	Dr Sarah Bolton: How CHEATA can support your feasibility study project
11.25	Interactive session: extending and confirming new collaborations: Prof Steve Morgan
12.15	Refreshments
12.30	Potential applicants pitch their research ideas
12.50	Dr Jasmine Harvey: Call for proposals
13.00	Closing remarks and feedback: Professor Steve Morgan
13.05	Workshop close, Lunch

Speaker profiles

Dr Sergiy Korposh is an Associate Professor in Electronics, Nanoscale Bioelectronics and Biophotonics at the University of Nottingham. His research focuses on the development and fabrication of chemical sensors based on a range of sensing platforms modified with functional nano-materials. Sergiy has spent 8 years in Japan, as a researcher/lecturer where he developed facile methods for the preparation of advanced functional nano –materials with properties and parameters that can be tailored to satisfy needs of specific applications. He has published more than 80 peer reviewed journal and conference papers, book contributions and hold 11 patents (several of which have been licensed to UK and Japan based companies). Sergiy is the Network Director of Cyclops.

Niels Peek is Professor of Health Informatics at the University of Manchester. With a background in Computer Science and Artificial Intelligence, his research focuses on data-driven informatics methods for healthcare quality improvement, data mining for healthcare, predictive models, and computerised decision support. He is director of the Greater Manchester Connected Health City, which is part of the £20M "Health North" investment to establish a learning health system in the North of England. Prof Peek has co-authored more than 150 peer-reviewed, scientific publications. Previously based at the University of Amsterdam, the Netherlands, he led the “CARDSS” initiative, a collaboration between academic partners, professional and patient organisations in cardiac rehabilitation, and industry partners which led to the introduction of computerised decision support in 40 Dutch hospitals and national quality standards for cardiac rehabilitation. From 2013 to 2017 he was the President of the Society for Artificial Intelligence in Medicine.

Professor Fran Game is a Consultant Diabetologist and Director of R,D&I at Derby Teaching Hospitals NHS FT. She is an Honorary Professor at the University of Nottingham and has an International reputation in the field of the Diabetic Foot. She has been Chief Investigator on several National and International trials, including several trials on wound healing. She regularly lectures at national and international diabetes conferences on the subject of the diabetic foot and has published over 70 papers and book chapters. She is current Chair of the Wound Healing subgroup of the International Working Group of the Diabetic Foot and has been an Associate Editor of Diabetic Medicine for the past 8 years. Closer to home, she co-chairs the East Midland Diabetic Foot network and works with Diabetes UK on their “Putting Feet First” campaign.

Poulam Patel is Professor of Clinical Oncology at the University of Nottingham and Honorary Consultant Medical Oncologist at Nottingham University hospitals NHS Trust. He is head of the Division of cancer & Stem Cells in the School of Medicine. In the clinic he focuses on the treatment of advanced melanoma and renal cancers and has a special interest in cancer immunotherapy both in the clinic and the laboratory.

Speaker profiles

Dr Dan Harvey is a Consultant in Adult Intensive Care at Nottingham University Hospitals, and an Hon. Associate Professor at the University of Nottingham. As National Education Clinical Lead for Organ Donation for the UK's NHS Blood & Transplant he has pioneered simulation training for organ donation with a particular interest in ethical decision making & critical care practise. He is a member of the UK Faculty of Intensive Care Medicine's Professional Standards Committee, and an author of the UK's National Guidelines for the Provision of Intensive Care Services. He is Vice Chair of the National Critical Care Group with the UK National Institute for Health Research (NIHR), and chair of a national consensus group shortly to publish guidance on the management of devastating brain injury in the UK.

Steve Morgan is Professor of Biomedical Engineering at the University of Nottingham and Co-Director of the Centre for Healthcare Technologies. His research focuses on the development of novel optical devices to monitor the microcirculation for application in tissue breakdown and wound healing. Steve's recent work involves the development of photonic textiles that when incorporated into garments can monitor pressure, temperature and the microcirculation. He has 2 licence agreements with Moor Instruments Ltd (blood flow imaging) and Footfalls and Heartbeats Ltd (Photonic Sensing Socks), and he is part of a research team involved in Heartlight Systems Ltd (heartlightsystems.com) which is developing an optical heart rate monitor for new born babies in the delivery room. Steve currently holds a Royal Society Industry Fellowship, and is the Principal Investigator of the Cyclops.

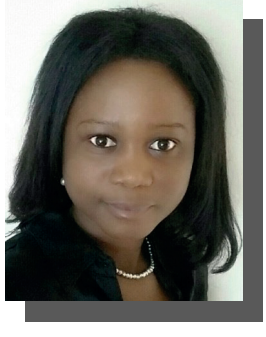
Dr Sarah Bolton is CHEATA's Business Manager. Sarah has been the Business Manager for CHEATA since August 2016. Prior to joining CHEATA, Sarah was responsible for Healthcare and Medical Devices at Pera Technology, a role which included project delivery, client engagement and management, project planning and management as well as bid writing for major UK and EC funding bodies. Sarah is an experienced research scientist with a background in academic and clinical research and she has specialized as an experimental histopathologist in the respiratory therapy area at AstraZeneca and as an independent consultant.

A leading expert on Molecularly Imprinted Polymers (MIPs) and biosensors, Sergey Piletsky is a Professor of Bioanalytical Chemistry at University of Leicester and Head of Leicester Biotechnology Group. Leicester Biotechnology Group is prime centre involved in research and development of MIPs and their application in biosensors for environmental, clinical, industrial and food applications. Prof. Piletsky is Visiting Professor in Jinan and Huazhong Universities, China, Toulon University, France, member of Editorial Board of ACS Combinatorial Sciences, Scientific Board of Society of Molecular Imprinting, Fellow of the Society of Biology, and Secretary General of the International Union of Advanced Materials.

Speaker profiles

Cameron Alexander is Professor of Polymer Therapeutics, an EPSRC Impact Fellow, and Head of the Division of Molecular Therapeutics and Formulation at the School of Pharmacy, University of Nottingham, UK. He is a Royal Society Wolfson Research Merit Award Holder, a Fellow of the Royal Society of Chemistry, a recent (2009-2014) EPSRC Leadership Fellow, and has published nearly 200 refereed articles. From 2006-2016, Professor Alexander led the EPSRC Centre for Doctoral Training in Advanced Therapeutics and Nanomedicines at Nottingham and University College London with a number of leading pharmaceutical industry partners. He received the Royal Society of Chemistry Macro Group Medal 2014 for contributions to polymer science."

Jonathan Hardman is clinical professor in anaesthesia and critical illness at the University of Nottingham, and a consultant anaesthetist in the NHS. He is the Director of Research at the School of Medicine at the University of Nottingham. His research focuses on the modelling of human pathophysiology including the application of modelling to anaesthesia and critical care. In Cyclops, he is a Co-Investigator and is co-leading the clinical exemplar area of Intensive Care.



Dr Jasmine Harvey is experienced in leading technology-based healthcare research projects. Previously, she was a post-doctoral researcher at University of Oxford, Nuffield Department of Primary Health Care, and the School of Medicine at the University at Nottingham. She also held brief roles at Universities of Warwick and Loughborough. Jasmine's current role is Cyclops healthcare network manager. She also holds an honorary assistant (consultant) professor post at the School of Medicine, University of Nottingham, and continues to work at the intersection of academia and management .

Support services for medical devices adoption and translation

Title and name	Expert area	Organisation	Email
Mrs. Beth Beeson	Medical Devices & Regulation	CHEATA, NUH NHS Trust	beth.beeson@nuh.nhs.uk
Dr. Sarah Bolton	Support for Cyclops Network partners including regulatory compliance support, human factors,	CHEATA, NUH NHS Trust	sarah.bolton@nuh.nhs.uk
Prof. Mike Hannay	Human Factors/ Adoption	EMAHSN	mike.hanny@nottingham.ac.uk
Mr. Chris Hart	Innovation funding and management	EMAHSN	sophie.marshall@nottingham.ac.uk
Dr Tanya McCallum	Research, training and services relating translating medical devices into practice	Centre for Healthcare Technologies	Tanya.McCallum@nottingham.ac.uk

Delegates interested in Cancer care

Title and Name	Expert area	Organisation	Email
Prof. Helen Byrne	Mathematical modelling at the life sciences interface	University of Oxford	helen.byrne@maths.ox.ac.uk
Mr. Xin Chen	Machine learning based medical image analysis; disease diagnosis/ prognosis	University of Nottingham	xin.chen@nottingham.ac.uk
Dr Judy Christian	Consultant clinical oncologist	Nottingham University Hospitals	Judith.Christian@nuh.nhs.uk
Mrs. Patricia Fairbrother	Patient Advocate, Lay research applications reviewer	Independent Cancer Patients	patriciafairbrother@gmail.com
Dr. Ketankumar Gajjar	Gynaecological cancer surgery and cancer diagnostics, minimal access surgery	Nottingham University Hospitals NHS	gajjarkb@gmail.com
Mr. Ulises Hernandez	Developing optical fibre sensing technology for biochemical detection	University of Nottingham	pazuh@exmail.nottingham.ac.uk
Dr. Jongrae Kim	Control engineer specialises in robustness analysis; inferring networks; control design for synthetic biological circuits; noise analysis; and large data analysis using parallel	University of Leeds	menjkim@leeds.ac.uk
Dr. Vlishwesh Kulkarni	Systems theoretical applications in bioengineering and healthcare	University of Warwick	V.Kulkarni@warwick.ac.uk
Prof. Melissa Mather	Biomedical imaging, non-invasive imaging, biophysics, optical	Keele University	m.mather@keele.ac.uk
Dr. Filippo Menolascina	In vivo control of gene networks, chemo informatics, microfluidics, microscopy	The University of Edinburgh	filippo.menolascina@gmail.com
Prof. James Moore	Lymphatic system mass transport	Imperial College London	james.moore.jr@imperial.ac.uk
Dr. Emilia Moradi	Drug delivery, imaging, cancer, cell biology	University of Nottingham	emilia.moradi@nottingham.ac.uk
Prof. Ioan Notingher	Microscopy, imaging, sensors	University of Nottingham	ioan.notingher@nottingham.ac.uk
Prof. Poulam Patel	Clinical Oncology, Novel systems	Nottingham University hospitals	Poulam.Patel@nuh.nhs.uk
Dr. Leandro Pecchia	Signal processing, sensing, data mining, circadian cycle control	University of Warwick	l.pecchia@warwick.ac.uk
Prof. Niels Peek	Computer Science and Artificial Intelligence. Various clinical areas	University of Manchester	niels.peek@manchester.ac.uk
Dr. Philip Pratt	Image-guided surgery, autonomous surgical robotics, intraoperative sensing (ultrasound, mass spec)	Imperial College London	p.pratt@imperial.ac.uk
Dr. Enrique SÃ¡nchez Lozano	Computer Vision, Machine Learning, Deep Learning, Face Tracking, Affective Computing	University of Nottingham	Enrique.SanchezLozano@nottingham.ac.uk
Dr. Mini Saaj	Design, mathematical modelling and control of robotic systems for medical applications	University of Surrey	c.saaj@surrey.ac.uk
Dr Ananth Sivanandan	Clinical oncologist	Nottingham University Hospitals	Mayuran.Sivanandan@nuh.nhs.uk
Prof. Paul Stewart	Intelligent Systems, various clinical areas	University of Derby	p.stewart1@derby.ac.uk
Dr. Vincent Teng	Development of biosensor using nanoscale electronic materials for the detection of diseases.	Swansea University	k.s.teng@swansea.ac.uk

Delegates interested in Chronic Wound care

Title and name	Expert area	Organisation	Email
Dr. Ali Alazmani	Soft Robotics, Soft Sensing and Actuation	University of Leeds	a.alazmani@leeds.ac.uk
Mr. Mohammed Al-Badri	Designing high resolution fetal heart rate monitor and developed device to care women in pregnancy period.	University of Nottingham	eexma67@nottingham.ac.uk
Dr. Jonathan Aylott	Nanoscale sensors and measurement of biological systems. Point-of-care diagnostics. Analysis to ensure quality in medicines manufacture for personalised therapy.	University of Nottingham	jon.aylott@nottingham.ac.uk
Prof. Dan Bader	Bioengineering strategies to prevent skin damage	University of Southampton	d.l.bader@soton.ac.uk
Dr. Paolo Bertoncello	Biosensors/Electrochemistry	Swansea University	p.bertoncello@swansea.ac.uk
Dr. Anil Bharath	Convolutional Neural Networks	Imperial College London	a.bharath@imperial.ac.uk
Dr. Samit Chakrabarty	Neurophysiologist	University of Leeds	samit@cantab.net
Prof. Adam Clare	Manufacturing technology	University of Nottingham	adam.clare@nottingham.ac.uk
Prof. Fran Game	Consultant Diabetologist	Derby Teaching Hospitals NHS Foundation Trust	frances.game@nhs.net
Prof. Amir Ghaemmaghami	Immune modulation, bio-instructive materials, immune-assisted tissue regeneration, immune-competent tissue models, wound healing.	University of Nottingham	amg@nottingham.ac.uk
Mrs. Sylvia Hampton	Wound care; presenting; writing; Working with nursing homes; hospitals; Industry. Research.	Wound Care Consultants Ltd	sylviehampton@outlook.com
Prof. Steven Jeffery	Burns and traumatic wounds	Queen Elizabeth Hospital	sjeffery@nhs.net
Dr Dai Jiang	Implantable and wearable electronics for biomedical applications	UCL	d.jiang@ucl.ac.uk
Prof John King	Mathematical Modelling	University of Nottingham	john.king@nottingham.ac.uk
Dr. KP Lam	Developing new cell-based therapies using autologous cells and stem cells.	Keele University	k.p.lam@keele.ac.uk
Prof. Steve Morgan	Sensors and instrumentation	University of Nottingham	steve.morgan@nottingham.ac.uk
Dr. Danny O'Hare	Biosensors	Imperial College London	d.ohare@imperial.ac.uk
Prof. Ipsita Roy	Production and development of natural polymers for use in health care applications. These have a range of mechanical, thermal and degradation properties which can be tailored.	University of Westminster	royi@wmin.ac.uk
Dr. Farshid Sefat	Developing and characterising biomaterials to control cellular behaviour. Developing engineered materials for tissue engineering including both soft and hard tissue (Skin, Cornea, bone and cartilage)	University of Bradford	f.sefat1@Bradford.ac.uk
Miss Nicolette Sizer	Final year student. Reducing pressure damage during prone positional surgery by designing a head support that can track pressure distribution on the face to reduce related damages in real time.	Nottingham Trent University	Nicolette.sizer@gmail.com
Dr. Reiko Tanaka	Mathematical modelling and computational design of treatment strategies for skin inflammation and lung infection by application of control theoretical tools. Machine learning methods.	Imperial College London	r.tanaka@imperial.ac.uk

Delegates interested in Critical (Intensive) Care

Title and name	Expert area	Organisation	Email
Dr. Tim Collins	Applied Signal Processing	Manchester Metropolitan	t.collins@mmu.ac.uk
Dr. Damion Corrigan	Development of electrochemical sensors for medical applications. Fabricating micro and nano sensors and using them to detect MRSA infections, sepsis and circulating tumour DNA for liquid biopsy.	University of Strathclyde	damion.corrigan@strath.ac.uk
Prof. Jonathan Hardman	Modelling, clinical medicine, critical care, anaesthesia	University of Nottingham	jghardman@gmail.com
Dr. Dan Harvey	Adult Intensive Care , critical care practice	Nottingham University Hospitals	Dan.Harvey@nottingham.ac.uk
Mr. Adrian Jackson	High performance and parallel computing, computational simulation, data analysis, code optimisation and novel hardware.	EPCC, The University of Edinburgh	a.jackson@epcc.ed.ac.uk
Prof. Stephen James	Optical instrumentation and sensors	Cranfield University	s.w.james@cranfield.ac.uk
Dr. Thomas Kissinger	Optical instrumentation, in particular fibre optic sensors and 3D imaging systems.	Cranfield University	t.kissinger@cranfield.ac.uk
Dr. Sergiy Korposh	Sensors in healthcare	The University of Nottingham	s.korposh@nottingham.ac.uk
Dr. Anh-Cat Le-Ngo	Computer Vision, Machine Learning, Facial Expression	University of Nottingham	lpzal1@nottingham.ac.uk
Dr. Andrew Norris	NHS Consultant 20 years. Special interest in airway research and practice and optical sensor applications. Currently have a Cyclops feasibility award developing optical drug sensors for critical care.	Nottingham University Hospitals NHS Trust	andrew.norris@nottingham.ac.uk
Dr. Galina Pavlovskaya	sensors, medical devices, mathematical modelling, MRI	University of Nottingham	galina.pavlovskaya@nottingham.ac.uk
Prof Sergey Pitletsky	Bioanalytical Chemistry, Molecularly Imprinted Polymers, biosensors	University of Leicester	sp523@le.ac.uk
Dr. Rasa Remenyte-Prescott	Modelling of safety and efficiency of clinical teams	University of Nottingham	r.remenyte-prescott@nottingham.ac.uk
Dr. Andrew Ward	Rapid, low cost detection of infectious microorganims using electrochemical techniques. Creating the instrumentation required to drive and measure electrochemical signals from a sensor.	University of Strathclyde	andrew.c.ward@strath.ac.uk
Dr. Homayemem Weli	Research student and junior clinician, with experience in acute medicine. Experienced in understanding human tissues as biomaterials in research, bridging the gap between clinical understanding and needs.	Keele University	h.k.weli@keele.ac.uk

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CHT Centre for Healthcare Technologies