

Collaborative PhD scholarships in Child Health Technology 2019/20

Sheffield Children's NHS Foundation Trust and Sheffield Hallam University are inviting applications for a collaborative PhD scholarship in the area of Child Health Technology, to start during 2019/20 academic year. The scholarship is jointly funded by Sheffield Hallam University and The Children's Hospital Charity.

Applicants should have a clinical or specified healthcare professional background (see Eligibility section for more information).

Our research areas

The focus of the call is for novel developments in Child Health Technology. This collaboration will enable the successful applicant to explore creative approaches to developing health technologies which directly address an identified clinical need and improve healthcare outcomes for patients. It is expected that applicants will develop their own topics and research proposals, based on their clinical knowledge and understanding of current issues and needs.

We are inviting research proposals in all areas of Child Health Technology; possible areas of focus include (but are not limited to):

- Virtual Reality / Augmented Reality / Gamification
- Sensor
- Artificial Intelligence / Machine Learning
- Robotics
- Telehealth
- Cybersecurity
- Big Data
- Diagnostic Technologies
- Tissue Engineering
- Additive Manufacturing / 3D Printing
- Wearables
- Assistive Technology
- Mobile Hardware / Software
- Apps
- Communication
- Digital

Your research proposal should demonstrate that it aligns with national strategic priorities in child health and addresses an identified clinical need.

You are encouraged to find out more about our staff and their current research to inform the development of your proposal. You should contact potential supervisors at an early stage to discuss and develop your research ideas.

For information on potential clinical supervisors at Sheffield Children's NHS Foundation Trust, please contact Professor Paul Dimitri (Director of Research and Innovation; paul.dimitri@sch.nhs.uk) or Dr Gillian Gatenby (Associate Director of Research and Innovation, gillian.gatenby@sch.nhs.uk).

Information and contact details for potential academic supervisors at Sheffield Hallam can be found by browsing the relevant [Research Centre or Institute](#) pages. Areas with research expertise of particular relevance to this call are:

[Materials and Engineering Research Institute](#)

[Biomolecular Sciences Research Centre](#)

[Cultural, Communication and Computing Research Institute](#) including [Lab4Living](#)

[Centre for Sports Engineering Research](#)

[Centre for Sport and Exercise Science](#)

Or see our full list of [Research Centres and Institutes](#). If you need further advice, please contact the University's Doctoral School doctoralschool@shu.ac.uk.

For successful candidates, the full supervisory team will be confirmed as part of the recruitment and admissions process. All projects will have joint academic and clinical (or clinical academic) supervision.

In addition to the above open call for proposals, we have a number of potential themes and projects which build on the current research of the academic supervisor at Sheffield Hallam University. If you are interested in applying for a project within one of the areas listed below, you should contact the identified academic supervisor to discuss detailed project plans. Note that you will still be expected to contribute to the design of the research project, and projects will have joint academic and clinical supervision.

Diagnostic Technologies

Thermal imaging and accelerometry-based skeletal surgeries monitoring and assessment

Contact: [Professor Reza Saatchi](#)

[Materials and Engineering Research Institute](#)

Skeletal surgeries are performed for joint replacement or fixation, arthroscopy, metal fixation, limb lengthening and trauma fixation with an external fixator. Following surgery, the healing process needs to be carefully monitored to ensure appropriate treatment. The existing methods involving measurement of temperature, blood tests and scans are generic, expensive, time consuming and often not accurate. The aim of this study is to design, develop and clinically evaluate innovative engineering technologies based on thermal imaging and accelerometry to monitor and assess the outcome of the skeletal surgeries. The study will develop innovative thermal imaging solutions to assess and monitor inflammation and surgical tissues' reaction and the time taken for them to settle down after skeletal operations.

An objective movement analysis tool to inform safe return-to-play in young people

Contact: [Dr Marcus Dunn](#)

[Centre for Sports Engineering Research](#)

Following anterior cruciate ligament (ACL) reconstructive surgery, only 55% of patients return to sport. In adolescents, $\leq 23\%$ suffer re-rupture, requiring further surgery and rehabilitation. Aside from surgical and rehabilitation costs, re-rupture increases risks of juvenile arthritis, reducing physical activity and quality-of-life. Adolescent strength and proprioception recovery are highly variable. Current multifactorial movement assessments can be inconsistent owing to poor specificity and sensitivity. A growing body of evidence indicates within-individual movement variability analysis provides insight into complex movement system change. Further, growth in consumer technologies capable of complex movement measurement presents an opportunity to identify clinically-feasible movement variability assessments. The aim of this project is to identify the application of movement variability analysis as an objective tool in adolescent ACL rehabilitation.

Novel Treatments

Tissue engineering approaches for child health

Contact: [Professor Christine Le Maitre](#)

[Biomolecular Sciences Research Centre](#) and [Materials and Engineering Research Institute](#)

Research focuses on tissue engineering approaches for child health. The specific focus of the project will depend on the research interests of the candidate. Potential topic areas include but are not limited to: Material technologies which could improve spinal fusions as treatments for scoliosis or spinal instability; Technologies for the repair and augmentation of bladder tissues in patients with spina bifida; Gastro intestinal tissue regeneration and augmentation in patients with short bowel syndrome. The research group has developed tissue engineering hydrogels and scaffolds which could be applicable to these disorders and has a number of tissue engineering interests in tissue augmentation and repair.

Development of a practical and cost effective respiratory rate and respiratory airflow measurement device

Contact: [Professor Reza Saatchi](#)

[Materials and Engineering Research Institute](#)

Currently there is no commercially available, accurate, easy to use and cost effective device that can provide respiratory information in a range of medical environments. The available devices tend to be expensive and can be intrusive. The aim of this study is to develop a device that can accurately measure respiration rate and respiratory airflow in a broad range of clinical environments, such as medical surgeries, ambulances, A&E, sleep laboratories and operating theatres. An important feature of the device is that it will be as un-intrusive as possible. The team is one of the leading groups nationally and internationally in research and development of respiration rate and respiratory airflow measurement.

Design

Co-design and development of healthcare interventions to improve child health

Contact: [Dr Joe Langley](#)

Cultural, Communication and Computing Research Institute

Our research spans a number of areas, all of which could be explored through the use of co-design methods and design practices. Areas of particular interest include:

- The development of equitable and accessible health service experiences for children with learning difficulties or autism
- Building 'knowledge' capacity in children with long term conditions
- Transitions
- Design as resourcefulness to enhance self-efficacy
- Child Prosthetics
- Using Design research methods to explore 'taboo topics' such as Urinary Continence
- Gamifying self-management behaviors
- Using design to understand and develop intrinsic motivators in children
- Co-designing healthcare interventions with children and young people.

A headline question in each area is "What can design research offer?"

Management

Development and assessment of the feasibility of a multi-generational lifestyle intervention aimed at children with Type 2 Diabetes Mellitus.

Contact: [Dr Markos Klonizakis](#)

Centre for Sport and Exercise Science

There are currently over 4.5 million people with Type 2 Diabetes Mellitus (T2DM) in the U.K. The average age of diagnosis is falling and the currently-recorded cases of paediatric T2DM amount to more than 530. The qualitative literature on the family environment and its relationship to T2DM has highlighted that younger generations are influenced by the experiences and beliefs of other family members who have lived with the condition. This suggests that family-based interventions that address the health beliefs and self-care family practices may be more efficacious than interventions aimed at individuals. Nevertheless, as different cultures hold different health beliefs which influence the complexities of lifestyle change, it is important firstly to understand the target community before implementing a diabetes intervention. This programme will aim to: i) understand the barriers and complexities of being at risk/living with multi-generational T2DM and, following that, co-design a targeted lifestyle intervention, ii) develop/refine the intervention and iii) test the feasibility of the developed intervention.

Moving beyond BMI: The use of 3D imaging in childhood weight management

Contact: [Dr Simon Choppin](#)

[Centre for Sports Engineering Research](#)

Obesity in childhood has been recognised as a global epidemic. Identification of childhood obesity is potentially problematic given natural variabilities and differing rates of development. Interventions that aim to tackle childhood obesity tend to focus on diet, lifestyle and exercise. Our area of research concerns 3D imaging technology which is able to capture the external geometry of people or objects. This information can be used to make clinical judgements, present information to the patient and make complex measurements which aren't possible with a standard camera or tape-measure. We are interested in the following research question: Can 3D imaging technology be used to improve the efficacy of weight-loss interventions and treatment in childhood obesity?

Effect of footwear on toddler gait, from walking independently up to the pre-school age

Contact: [Dr Gabriella Penitente](#)

[Centre for Sports Engineering Research](#)

The effect of footwear on children's gait is poorly understood. Many gait disturbances typical of young children are caused by the immature structure of the bones of the feet and the poor strength of their muscles. Although these abnormalities often resolve spontaneously, the use of appropriate footwear that can ensure the healthy growth of the foot and the correct neuro-motor development may be crucial. Findings from this project can support the selection of footwear to maximise the results of specific interventions aimed to correct altered gait, or prescribe the correct footwear as a prevention measure for young children presenting common gait abnormalities.

Eligibility

Applicants will need to fulfil the University's admissions requirements for research degrees including the necessary academic attainment and submission of a suitable research proposal, as well as any English language requirements where applicable.

These scholarships are only available to clinicians, nurses, allied healthcare professionals and clinician scientists. If you are uncertain whether you are eligible for these scholarships, you should contact Professor Paul Dimitri or Dr Gillian Gatenby to check clinical eligibility.

- All applicants should hold a strong undergraduate degree (2.1 or above) and/or a relevant masters qualification (or expectation of the same).
- Scholarships are open to home, EU and international applicants. However, scholarships pay fees at home/EU levels only, and international students will be expected to provide the difference between the home/EU and international fees from another funding source.
- Where English is not your first language, you must show evidence of English language ability to the following minimum level of proficiency: an overall IELTS score of 7.0 or above, with at least 6.5 in each component or an [accepted equivalent](#). Please note that your test score must be current, i.e. within the last two years.
- Currently enrolled PhD students are not eligible to apply for these scholarships
- Members of the University's academic staff are not eligible to apply for these scholarships
- Students in full-time employment are not eligible for University scholarships that include a stipend.

How to apply

1. Find supervisors

You are encouraged to find out more about our staff and their current research to inform the development of your proposal. You should contact potential supervisors at an early stage to discuss and develop your research ideas.

For information on potential clinical supervisors at Sheffield Children's Hospital, please contact Professor Paul Dimitri (Director of Research and Innovation; paul.dimitri@sch.nhs.uk) or Dr Gillian Gatenby (Associate Director of Research and Innovation, gillian.gatenby@sch.nhs.uk).

Contact details for potential academic supervisors at Sheffield Hallam can be found by browsing the relevant [Research Centre or Institute](#) pages, or you can contact the University's Doctoral School doctoralschool@shu.ac.uk.

2. Develop your research proposal

Once you have discussed your research idea you should produce a clear, detailed research proposal. You will need to evidence that you have an aptitude for doctoral level research, and that you can communicate your research ideas clearly and concisely.

Proposals should be up to 1500 words long and include:

- an outline of the proposed research and the central questions, problems or hypothesis that you plan to address, including the alignment with national strategic priorities in child health and discussion of the clinical need for your project
- the current knowledge and context, referencing key background literature
- proposed methodology or approach, if known
- the potential significance or impact of the research, including the potential impact for SCH and/or its patients.

3. Submit your application

To consider your application, we will need

- a completed [application form](#)
- your research proposal, attached as a separate document (Word or PDF)
- two academic references (a reference form is included as part of the application form)
- copies of qualifications, certificates and/or results transcripts
- proof of English language ability where English is not your first language
- copies of your passport and any relevant visas for International applicants

You should submit your application via email to doctoralschool@shu.ac.uk by the closing date of **23:30 on Monday 9 December 2019**. Please state "SCH/SHU PhD scholarship application" in the subject field of your email. Please note we are unable to accept late applications.

About these scholarships

Sheffield Hallam University and Sheffield Children's Hospital have a history of successful research collaboration, including PhD research.

[Research at Sheffield Children's NHS Foundation Trust](#) covers a wide range of clinical specialties, working with some of the country's leading professionals in paediatric conditions. The Sheffield Children's Clinical Research Facility (CCRF) opened in 2008 and was the first paediatric clinical research facility in the UK. Our Directorate of Research and Innovation is a 'one stop shop' for research professionals, supporting both the set up and delivery of research running at the Trust. Currently we have over 300 research projects open in the Trust and these range from highly complex clinical trials of investigative medicinal products to small pilot studies. Last year over 2500 patients and volunteers participated in research at our Trust. Much of the research we undertake is funded wholly or in part by the National Institute of Health Research (NIHR) and in 2018-19 our Trust was the top performing Trust in the region for recruitment to NIHR badged children's research studies – an accolade we have achieved 2 years running. Within our Clinical Research Facility we have a team of highly skilled research nurses, officers and data managers to support our research. We also have a team specialising in all aspects of research governance. We are keen to grow our own researchers and support those who are at the early stages of their clinical research careers. We believe our excellent research facilities offer researchers all that they may require to support their research ambitions and we aim to see research expand in all of our clinical specialties. Visit our website for more information on our research interests and the Trust <https://www.sheffieldchildrens.nhs.uk/>

Sheffield Children's NHS FT hosts the NIHR Children and Young People MedTech Co-operative (NIHR CYP MedTech) and the National TITCH (Technology Innovation Transforming Child Health) network. These child health technology networks have been established to support the development and spread of child health technology through partnership across the clinical, academic and private sector. NIHR CYP MedTech and TITCH has successfully supported funding calls, worked with SMEs to bring technology to the NHS and identified unmet needs leading to technology areas in key field of paediatrics and child health. For more information visit <https://cypmedtech.nihr.ac.uk/> and www.titch.org.uk

[Research](#) at Sheffield Hallam in the area of child health encompasses a range of disciplines and approaches. We provide a multi-disciplinary research environment with expertise spanning engineering; materials science; biomolecular sciences and tissue engineering; design and co-design methodologies; the use and development of digital media and gaming applications for clinical applications; qualitative and quantitative approaches to understanding the patient experience; physical activity, exercise science and lifestyle

interventions; and health and social care. See our [website](#) and [brochure](#) for an overview of some of our health technologies research.

Scholarships are available for 3 years of full-time or 5 years of part-time study.

The PhD scholarship will provide you with:

- University tuition fees at Home/EU levels. Note that the scholarship covers tuition fees at Home/EU levels only, and if you are liable to pay fees at the International rate you will be expected to pay the difference between the Home/EU and International fees yourself (or from another funding source).
- An annual maintenance stipend at standard UKRI national minimum doctoral stipend rates (£15,009 per annum for 2019/20 full-time study, reduced rate for part-time). The stipend is paid to you on a monthly basis as a tax-free bursary and is intended to cover basic living costs to enable you to undertake your studies.
- Project expenses and costs as agreed as part of the admissions process, although successful applicants will be encouraged to seek additional funding from other sources to support the costs of the research project (e.g. project consumables).

PhD researchers will be registered for a PhD at Sheffield Hallam University and will be expected to be based in Sheffield. Researchers will be supported by a supervisory team comprising academic and clinical supervisors from both institutions. Alongside furthering your knowledge and expertise in your chosen field, as a PhD researcher you will develop core research skills including understanding of methodologies; literature review and critical appraisal; data analysis and management; research integrity and ethical research practice; and dissemination skills including writing, presentation and public engagement.

The Conditions of Award for University Scholarships from Sheffield Hallam University can be found at <https://www.shu.ac.uk/research/degrees/phd-scholarships/university-scholarships>

Selection process

Applications will be reviewed by a joint SCH-SHU panel, and shortlisted candidates invited to interview.

Interviews will take place in Sheffield; it is anticipated that these will be on Wednesday 8 January 2020.

Candidates will be asked to deliver a 10 minute presentation on their research proposal, followed by an interview.

Where travel to Sheffield for interview is not possible, interviews may be conducted by Skype or conference call.