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# Irene Yang

BMedSci, BEng (Hons I), DPhil (Oxon)

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## EMPLOYMENT

Apr '22 – Current

### POSTDOCTORAL RESEARCH FELLOW – University of Edinburgh, Scotland

- + Project: UltraSurge - Surgery enabled by ultrasonics (EPSRC grant no.: EP/R045291/1)
- + Activities:
  - Mechanical rig design and development (Arduino coding)
  - Robot Operating Systems (ROS) programming (Python)

Mar '18 – Sep '18

### PRODUCT DEVELOPER – IDE Group, Australia

- + Project: ELION HIV point-of-care diagnostic device
  - Client: Atomo Diagnostics
- + Activities: Verification & validation testing and management

Jan '16 – Jun '17

### RESEARCH ASSISTANT – Westmead Children's Hospital, Australia

- + Projects:
  - Design of a tension band plate for genu varum/ genu valgum
  - Design of a wrist fusion plate for FFD in Cerebral Palsy
  - Design and development of a low cost intra-medullary nail for bone fractures
- + Activities: Summer research, honours and medical student supervision

## EDUCATION

Oct '18 – Jun '22

### DPHIL MUSCULOSKELETAL SCIENCES – University of Oxford, United Kingdom

- + *Reducing dislocations in the Domed Lateral Oxford Knee.*
- + Supervisors: Prof. David Murray, Associate Prof. Stephen Mellon
- + Final viva date: March 2022.

Jan '11 – Dec '15

### B. MECHANICAL ENGINEERING (HONS) – University of Sydney, Australia

- + *The design, development and manufacture of a tension band plate.*
- + Supervisors: Prof. David Little, Ass. Prof. Aaron Schindeler
- + Award: Class I Hons, Biomedical Engineering major.

Jan '11 – Dec '15

### B. MEDICAL SCIENCE – University of Sydney, Australia

- + Major: Biochemistry
- + Award: Bachelor's degree with distinction

Jan '06 – Dec '10

### GAUTENG DEPT EDUCATION MATRIC CERT. – Crawford College, South Africa

- + Subjects: English, Afrikaans, Mathematics, Science, Biology, History, Life Orientation, Additional Mathematics, Mathematics (Geometry)
- + Award: 9 distinctions, top 51 in South Africa

## SKILLS

Languages  
Skills/certifications

**Fluent:** English, Fuzhouhua

**Semi-fluent:** Afrikaans, Mandarin

Cochrane systematic review, Solidworks (3D CAD design), 3D printing (FDM, SLS, SLA), 3D image segmentation (MIMICS), MATLAB, Photoshop, Microsoft Office, Python coding

Courses

Oxford Biodesign program, Acumen & IDEO.org human centred design course, IDE Group Medical Device Development course

## PRIZES / AWARDS

Feb '23

### INTERNATIONAL TRAVELLING FELLOWSHIP – British Orthopaedic Research Society/Bone & Joint Research Journal, UK

- + Selection process: Paper application for shortlisting, interview for award (selection panel: UK wide professors from engineering, biology and orthopaedic surgery).
- + Details: Present research at the 2023 Orthopaedic Research Society (ORS) conference (USA), and at leading research labs/institutes in Denver, Philadelphia, Boston, NY and Ottawa (Canada).
- + Value: National early career leader in orthopaedic engineering research, international conference presentation to lead future research, international networking opportunity.

Dec '22

**GIANT (GLOBAL INNOVATION AND NEW TECHNOLOGY) CONFERENCE TRAVEL FUNDING – University of Edinburgh (iTPA/Edinburgh Innovations), UK**

- + Selection process: Email application for award.
- + Details: Five funded places to attend the 2022 GIANT conference in London.
- + Value: Recognition of research impact & research commercialisation potential.

Feb '21 & Feb '22

**OXFORD/SANTANDER TRAVEL ABROAD BURSARY – University of Oxford, UK**

- + Selection process: Paper application for award.
- + Details: 2021 funding forfeited (pandemic). Re-application granted to fund local & international travel costs, accommodation and living costs to present research at the 2022 Orthopaedic Research Society (ORS) conference (USA).
- + Value: Recognition of research excellence & research impact.

Feb '22

**TRAVEL BURSARIES: 1) NEW COLLEGE, 2) NDORMS – University of Oxford, UK**

- + Selection process: Paper application for award.
- + Details: Funding granted to fund local & international travel costs, accommodation and living costs to present research at the 2022 Orthopaedic Research Society (ORS) conference (USA).
- + Value: International research excellence

Sep '21

**2ND PRIZE ENGINEERING SCIENCE DOCTORAL RESEARCH AWARDS – Association of British Turkish Academics, UK**

- + Selection process: Paper application for shortlisting, candidates compete via live presentation for award (selection panel: general audience and funding body representatives).
- + Details: Academic presentation competition.
- + Value: National research excellence, recognition of novel research.

Jun '21

**1ST PRIZE HEALTHCARE TECH AWARDS – Institute Of Mechanical Engineers, UK**

- + Selection process: Paper application, narrated slideshow presentation recording for shortlisting, shortlisted applicants compete via live presentation for award (selection panel: general audience and industry professionals).
- + Details: Academic presentation competition.
- + Value: National research excellence, recognition of novel research.

Jun '21

**1ST PRIZE BOTNAR STUDENT SYMPOSIUM – University of Oxford, UK**

- + Selection process: Candidates compete via live presentation for award (selection panel: general audience and department professors).
- + Details: Academic presentation competition.
- + Value: Departmental research excellence, recognition of novel research.

Jul '20

**1ST PRIZE MEDICAL SCIENCES DIVISION RESEARCH SLAM – University of Oxford, UK**

- + Selection process: Department wide competition, candidates compete via live presentation for award (selection panel: general audience and department professors).
- + Details: "Reducing Dislocation of the Mobile Bearing in the Oxford Domed Lateral Implant."
- + Value: Departmental research excellence, recognition of novel research.

Aug '19

**PHD TRANSLATIONAL RESEARCH FELLOWSHIP – European Institute of Innovation and Technology Health, European Union**

- + Selection process: paper application (UK and EU applicants combined), panel interview for award (selection panel: Oxford Innovations representative, department and UK professors).
- + Details: €5,000 grant, one week translational fellowship training camp at Oxford University.
- + Value: European research excellence, novel implant design ideas, translational research leader.

Oct '18

**OXFORD CLARENDON SCHOLARSHIP – Oxford University Press, University of Oxford, UK**

- + Selection process: All postgrad applicants to Oxford University considered, panel interview for award (selection panel: department professors).
- + Details: Three years full international student university fees, college fees and living stipend to read for a DPhil at Oxford University.
- + Value: Top 2% of all graduate applicants (individual excellence & research impact),

Jan '14

**SYDNEY MEDICAL SCHOOL RESEARCH SCHOLARSHIP – University of Sydney, AUS**

- + Selection process: Paper application for award, department wide competition.
- + Details: Two months research funding and living stipend.
- + Value: Individual excellence (undergraduate research), paid summer research internship.

**1ST PLACE HEALTH SCIENCE PROSEOTION COMPETITION – University of Sydney, AUS**

Jan '13

**LEADERSHIP**

Academic

**Journal contributions (2022 - Current)**

- Associate editor and reviewer - Bone and Joint Research (BJR) Journal
- Reviewer - Frontiers in Bioengineering and Biotechnology Journal

**Committees (2022)**

- International Combined Orthopaedic Research Societies (ICORS) committee member

**Student supervision (2022 - Current)**

- Monu Jabbal (Doctor of Medicine, University of Edinburgh)

**PUBLICATIONS**

Research papers

**I. Yang, J. D. Gammell, D. Murray, S. Mellon (2022)**, *Application of a robotics path planning algorithm to assess the risk of mobile bearing dislocation in lateral unicompartmental knee replacement*. Sci Rep 12, 2068. <https://doi.org/10.1038/s41598-022-05938-w>

**I. Yang, J. D. Gammell, D. Murray, S. Mellon (2021)**, *The Oxford Domed Lateral Unicompartmental Knee Replacement implant: Increasing wall height reduces the risk of bearing dislocation*. Proc Inst Mech Eng H. 2022 Mar;236(3):349-355. doi: 10.1177/09544119211048558. Epub 2021 Oct 26. PMID: 34696644; PMCID: PMC8822200.

**I. Yang, T. Hamilton, S. Mellon, D. Murray (2021)**, *Systematic review and meta-analysis of bearing dislocation in lateral meniscal bearing unicompartmental knee replacement: Domed versus flat tibial surface*, vol 28, pp.214-28, The Knee.

**I. Yang, J. D. Gammell, D. Murray, S. Mellon (2020)**, *Application of a robotics path planning algorithm to assess the risk of mobile bearing dislocation in lateral unicompartmental knee replacement*. The 20th Annual Meeting of the International Society for Computer Assisted Orthopaedic Surgery, EasyChair series EPIC Series in Health Science, vol 4, pp. 301-5.

**J. Kennedy, H. Mohammad, I. Yang, S. Mellon, C. Dodd, H. Pandit, D. Murray (2020)**, *Oxford Domed Lateral Unicompartmental Knee replacement: 10 year survival clinical outcome*, Journal of Bone and Joint Surgery [Br], 102-B(8):1033-40.

**I. Manavitehrani, P. Ebrahimi, I. Yang et al. (2019)**, *Current Challenges and Emergent Technologies for Manufacturing Artificial Right Ventricle to Pulmonary Artery (RV-PA) Cardiac Conduits*. Cardiovasc Eng Tech 10, 205–215. <https://doi.org/10.1007/s13239-019-00406-5>

**I. Yang, M. Gottliebsen, P. Martinkevich et al. (2018)**, *Guided Growth: Current Perspectives and Future Challenges*. Journal of Bone and Joint Surgery [Am] Rev. 2017 Nov;5(11):e1. doi: 10.2106/JBJS.RVW.16.00115. PMID: 29112518.

**I. Yang, T. Cheng, D. Little (2015)**, *Orthopaedic device for correction of deformities in bone*, patent no.: US10842509B2. Licence: Orthopediatrics Corp., 2016.

**I. Yang, T. Cheng, D. Little (2016)**, *Wrist fusion plate*, Licence: Orthopediatrics Corp.

**A. Marek, N. Alnamnam, X. Li, A. Luczak, I. Yang, M. Lucas, H. Simpson, F. Pierron (Jul, 2023)**, *Ultra-high speed imaging for studying ultrasonic cutting of bone & cartilage*, European Society of Biomechanics. Maastricht, NL.

**N. Al-Namnam, A. Luczak, I. Yang, X. Li, M. Lucas, A. C. Hall, A. H. Simpson (Feb, 2023)**, *Chondroprotection during cutting of human articular cartilage using an ultrasonic scalpel: An in vitro study*, Orthopaedic Research Society conference. Texas, USA.

**I. Yang, N. Al-Namnam, A. Marek, X. Li, M. Lucas, A. H. Simpson (Feb, 2023)**, *Ultrasonic cutting tools for orthopaedic surgery: Mechanical test rig design and preliminary testing in human bone*, Orthopaedic Research Society conference. Texas, USA.

**I. Yang, J. D. Gammell, S. Mellon, D. Murray (Feb, 2022)**, *A novel computational dislocation analysis tool using robotics path planning algorithms for mobile bearing lateral unicompartmental knee replacement surgery*, Orthopaedic Research Society conference. Florida, USA.

IP (Patents, licenses)

Conference presentations

**I. Yang, Linda Chikotho, Girish Gangan, Chris Lavy et al. (April, 2022)**, Panel discussion – Orthopaedic devices: Inequalities, challenges and opportunities (Virtual session), International College of Surgeons United States Section Annual meeting.

**I. Yang, J. D. Gammell, D. Murray, S. Mellon (Sept, 2021)**, Modifying the Design of The Oxford Domed Lateral Unicompartmental Knee Replacement Implant Reduces the Risk of Medial Bearing Dislocation, British Orthopaedic Research Society conference. Virtual.

**I. Yang, J. D. Gammell, S. Mellon, D. Murray (Feb, 2021)**, The Oxford Domed Lateral Implant: increasing tibial component wall height reduces the risk of medial dislocation of the mobile bearing, Orthopaedic Research Society conference. Virtual.

**H. Mohammad, J. Kennedy, I. Yang, S. Mellon, H. Pandit, C. Dodd, D. Murray (Oct, 2020)**, The 10 Year Clinical Outcomes Of The Oxford Lateral Domed Unicompartmental Knee Replacement, EFORT conference. Virtual.

**I. Yang, J. D. Gammell, S. Mellon, D. Murray (Oct, 2020)**, Application of a robotics path planning algorithm to assess the risk of mobile bearing dislocation in lateral unicompartmental knee replacement, EFORT conference. Virtual.

**I. Yang, J. D. Gammell, S. Mellon, D. Murray (Mar, 2020)**, Application of a robotics path planning algorithm to assess the risk of mobile bearing dislocation in lateral unicompartmental knee replacement, STEM for Britain competition. Parliament, UK.

**I. Yang, S. Mellon, D. Murray (Sept, 2019)**, Dislocation of the mobile bearing in the Lateral Oxford Unicompartmental Knee Replacement (LOUKR): the effect of knee flexion, British Orthopaedic Research Society/Bone Research Society (BORS/BRS) conference, Cardiff, UK.

**I. Yang, S. Mellon, D. Murray (Jul, 2019)**, Dislocation of the mobile bearing in the Lateral Oxford Unicompartmental Knee Replacement (LOUKR): the effect of knee flexion, Medical Science Division DPhil Day, Tingewick Hall, Oxford, UK.

**I. Yang (Nov, 2016)**, All things 3D: 3D printing, 3D scanning and 3D animation, Australian Institute of Medical and Biological Imaging (AIMBI) Changing perspectives Conference, Sydney, Aus.

**I. Yang, T. Cheng, D. Little (Oct, 2016)**, Optimisation of the telescopic rod using 3D Computer Aided Design (CAD) Software and Finite Element Analysis (FEA), Australian Orthopaedic Association (AOA) conference, Cairns, Aus.

**I. Yang (May, 2021)**, Orthopaedic Implant design, Jiangmen Central Hospital, Zhuhai, People's Republic of China.

**I. Yang, S. Mellon, D. Murray (July, 2020)**, Using Robotics to Address the Problem of Mobile Bearing Dislocation in the Oxford Domed Lateral Implant. MSD Research SLAM, NDORMS, Oxford, UK. Virtual.

**I. Yang, S. Mellon, D. Murray (Sept, 2019)**, A New design for the lateral Oxford Unicompartmental Knee Replacement, IDEAL Collaboration Sandpit session, Trinity College, Oxford, UK.

**I. Yang (Jun, 2019)**, Ethics in Surgical Implant Innovation, Global Scholars Symposium, Rhodes House, Oxford, UK.

**I. Yang, T. Cheng, D. Little (Aug, 2016)**, Optimisation of the telescopic rod using 3D Computer Aided Design (CAD) Software and Finite Element Analysis (FEA), Westmead Hospital Research Symposium, Westmead Children's Hospital, AUS.

Invited talks

## OTHER

Volunteering

### New College Oxford

- Peer supporter (2020, 2021), Welfare Officer (2020), Equality & Diversity Officer (2019).

**St John's Ambulance:** First Aider (2018, 2019)

**Oxford Clarendon Council:** Cultural Secretary (2018)

Oil painting, sketches (pencil, colour pencil), photography, blogging, hiking.

**I. Yang**, New College Arts Anthology: **2020** (p. 82), **2021** (p. 27, 68-9), Oxford University, UK.

Hobbies