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

EMPLOYMENT

Jan '25 – Current

ASSISTANT PROFESSOR – **University of Western Ontario, Canada**

+ WEST Lab: Western Engineering for Spine and Trauma Lab
+ Schulich School of Medicine & Dentistry
+ Department of Mechanical and Materials Engineering, Faculty of Engineering

Sept '23 – Dec '23

ACADEMIC RESEARCH FELLOWSHIP – **University of Edinburgh, Scotland**

+ Project: Developing a novel, simple, affordable and clinically relevant fracture monitoring tool for low resource settings using engineering & machine learning techniques
+ Activities:
  - Machine learning (Python coding)
  - Qualitative mixed methods study design, ethics
  - Teaching: Immunology

Apr '22 – Sept '23

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
  - 3D animation for surgical teaching
+ Activities: Summer research, honours and medical student supervision

EDUCATION

Oct '18 – Mar '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

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Languages
Fluent: English, Fuzhouhua **Semi-fluent:** Afrikaans, Mandarin

Skills/certifications
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

AWARDS

Professional

INNOVATION FELLOWSHIP GRANT (2024)
BIG IDEAS ACCELERATOR GRANT (2023)
BEST INTERNATIONAL STUDENT AMBASSADOR (2015)
BEST INTERNATIONAL STUDENT AMBASSADOR (2014)

Postgraduate

2023 BRITISH ORTHOPAEDIC RESEARCH SOCIETY/BONE & JOINT RESEARCH TRAVELLING FELLOW (2023)
CONFERENCE TRAVEL FUND (2022)
OXFORD CLARENDON SCHOLARSHIP (2018)
EIT HEALTH PHD TRANSLATIONAL RESEARCH FELLOWSHIP (2019)
OXFORD/SANTANDER TRAVEL ABROAD BURSARY (2022)
NEW COLLEGE TRAVEL BURSARY (2022)
NDORMS TRAVEL ABROAD BURSARY (2022)
IMECHE HEALTHCARE TECH AWARDS, 1ST PRIZE (2021)
BOTNAR STUDENT SYMPOSIUM, 1ST PRIZE (2021)
DOCTORAL RESEARCH AWARDS, 2ND PRIZE ENGINEERING SCI (2021)
MEDICAL SCIENCES DIVISION RESEARCH SLAM, 1ST PRIZE (2020)
OXFORD/SANTANDER TRAVEL ABROAD BURSARY (2020)

Undergraduate

SYDNEY MEDICAL SCHOOL RESEARCH SCHOLARSHIP (2014)
1ST PLACE HEALTH SCIENCE PROSECTION COMPETITION (2013)

LEADERSHIP

Academic

Journal contributions (2022 - Current)

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

Committees (2022)

- *International Combined Orthopaedic Societies (ICORS) local committee member*

Student co-supervision (2022 - Current)

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

PUBLICATIONS

Research papers

N. M. Al-Namnam, A. T. Luczak, I. Yang, X. Li, M. Lucas, A. C. Hall, A. H. R. W. Simpson (2024), *Chondroprotection of articular cartilage integrity: Utilizing ultrasonic scalpel and hyperosmolar irrigation solution during cutting*, Osteoarthritis and Cartilage Open, Volume 6, Issue 3.

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 (2022). 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), *A systematic review on the dislocation of the mobile bearing in the Domed Lateral Oxford Knee: flat versus domed*, 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.

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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, S. Daly, A. Schindeler, A. Saxena, D. G. Little, D. F. Fletcher, F. Dehghani & D. S. Winlaw, *Current Challenges and Emergent Technologies for Manufacturing Artificial Right Ventricle to Pulmonary Artery (RV-PA) Cardiac Conduits*. Cardiovasc Eng Tech 10, 205–215 (2019). https://doi.org/10.1007/s13239-019-00406-5

I. Yang, M. Gottliebsen, P. Martinkevich, A. Schindeler, D. Little (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.

Book chapters

I. Yang, B. H. van Duren, H. G. Pandit. (2024). *Lateral unicompartmental knee replacement surgery for lateral knee osteoarthritis*. Deshmukh, A.J., Shabani, B.H., Waldstein, W., Oni, J.K. Surgical Management of Knee Arthritis. : Online. Publisher: Springer Nature.

IP (Patents, licenses)

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 (2015), *Orthopaedic device for correction of deformities in bone*, patent no.: WO2016123671A1.

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

Conference talks

I. Yang, J. A. Nicholson, P. Abernethy, L. Roebuck, A. Thomson, C. M. Moran, A. H. Simpson (2024), Ultrasound Imaging for Orthopedic Surgery: Recommendations for Minimum Reporting Requirements of Clinical Features – Results From an Expert Consensus Meeting, International Section of Fracture Repair (ISFR)/ Orthopedic Trauma Association (OTA) meeting, Montreal, Canada.

Speakers: I. Yang, Linda Chikotho, Girish Gangan, Chris Lavy, Emmanuel Makasa, Claude Martin, Lewis Zirkle, (Moderators: Kiran Agarwal-Harding, Sayed Shah) (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*, BORS conference.

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*, North Sydney Harbourview Hotel, 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), Cairns, AUS.

Conference posters

I. Yang, R. Buchanan, K. Nazarpour, A. H. Simpson. (Feb, 2025). *Automated segmentation of long bones in ultrasound images: comparing segmentation performance of four state-of-the-art clinically used pretrained convolutional neural networks*. ORS Conference, Arizona, USA.

I. Yang, J. A. Nicholson, P. Abernethy, L. Roebuck, A. Thomson, C. M. Moran, A. H. Simpson. (Oct, 2024). Ultrasound imaging for orthopedic surgery: recommendations for minimum reporting requirements of clinical features - results from an expert consensus meeting. ORS/International Section for Fracture Repair 18th Biennial Meeting, Montreal, Canada.

N. Aghili, K. Hughes, K. Nazarpour, A. H. Simpson, I. Yang. (Sept, 2024). *Evaluating the impact of AI in orthopaedics: a systematic scoping review of current evidence and gaps in the knee joint*. BORS conference, Sheffield, UK.

I. Yang, R. Buchanan, N. Al-Namnam, X. Li, M. Lucas, A. H. Simpson. (Feb, 2024). *The use of an ultrasonic tool to cut human bone: cutting forces of orthopaedic surgeons*. ORS conference, Long beach, California, USA.

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

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, ORS conference*, ORS conference. Dallas, Texas.

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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*, ORS conference. Dallas, Texas.

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*, ORS conference. Tampa, Florida, USA.

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*, ORS 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. Attlee Suite, Portcullis House, Parliament, UK.

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

Invited talks

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.