REZA KALANTAR

Ph.D Researcher • Deep Learning • Cancer Imaging

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EDUCATION

The Institute of Cancer Research, London, UK
OCT 2019 - PRESENT

PHD DEEP LEARNING IN CANCER IMAGING

Research Focus: Developing novel artificial intelligence (AI) frameworks for large-scale pelvic cancer diagnosis, segmentation and quantitative tumour analysis

Key Topics:
- Supervised and unsupervised image synthesis (GANs, diffusion models)
- Image segmentation (U-Net, attention gates, vision transformers)
- Large-scale transfer learning (Cross-Domain, VGG, DenseNet, ResNet)
- Image registration, super-resolution & reconstruction
- AI explainability (activation mapping, GRAD-CAM)
- Processing and analysis of 3D medical images (Dicom, Nifti, RTS)

Imperial College London, London, UK
SEP 2018 - SEP 2019
Distinction

MRES MEDICAL ROBOTICS AND IMAGE-GUIDED INTERVENTION

Individual Project: Gaze-guided assistive robotics for patients with motor impairment using deep learning and robotic manipulators

Team Project (Team Leader): Dietary intake recognition and volume estimation using deep learning (YOLO), and simultaneous localisation and mapping (SLAM)

University of Leeds, London, UK
SEP 2013 - JULY 2018
Upper Second Class

MENG & BENG MEDICAL ENGINEERING

MEng Team Project: Tribocorrosion of Nitinol stents under tension using mechnical design in-situ and computational modeling

BEng Individual Project: Analysis on biomechanical properties of porcine cortical bone

Erasmus 1: Simon Fraser University (SFU), Vancouver, Canada - Engineering Science

Erasmus 2: Hong Kong University of Science and Technology (HKUST), Hong Kong - Business and technology innovation

Uxbridge College, London, UK
SEP 2011 - JULY 2013

A-LEVELS

Topics: Mathematics; Further Mathematics; Physics; Persian Language; Chemistry (AS)

AWARDS

- The prestigous PhD studentship at the Institute of Cancer Research (ICR) and the Royal Marsden Hospital (RMH), **worth £23,000 (+ £12,500 research budget)** per annum
- **MRes, The best research poster design and presentation award** at the Hamlyn Symposium Medical Robotics Showcase 2019, Imperial College London
- The Hamlyn Centre, Imperial College London **student scholarship worth £12,000** to support post-graduate studies
- The outstanding performer in Mathematics and Further Mathematics, Uxbridge College London **(press release)**
- **Bronze medals** in swimming regional championship (Backstroke & 4x25 medley) , high school

OPEN SOURCE CONTRIBUTIONS

Covid-19 Detector iOS Application: End-to-end desgin and development of an iOS application with embedded deep learning classifier model for Covid-19 pneumonia detection, anonymization and crowd-sourcing

Automatic volumetric lung segmentation and disease detection on CT and X-Ray imaging: Transfer learning from a VGG-19 model to perform diagnosis and segmentation from open source databases

SOFTWARE SKILLS

• **Programming Languages:** Python, C++, Swift, MATLAB • **Deep Learning Libraries:** PyTorch, TensorFlow, Keras, Monai, Scikit-Learn, etc. • **Operating Systems:** Linux, Mac, Windows • **Practical Software and Libraries:** Git, Docker, Google Colab, Adobe Illustrator, Photoshop & InDesign, Robotic Operating System (ROS), Numpy, Pandas, Scipy
• **Medical Imaging:** Dicom, Nibabel (Nifti), SimpleITK, PyDicom, ITKsnap, ImageJ, 3D Slicer

EXPERIENCE

Imperial College London, London, UK
OCT 2018 - SEP 2019

COURSE REPRESENTATIVE
Responsibilities: Facilitating communication between students and faculty members - participating in regular meetings - representing the student body

Nika Arvin Pouya ltd., Hong Kong, Iran (Remote)
SUMMER 2017

INTERNATIONAL REPRESENTATIVE (MEDICAL DEVICES)
Responsibilities: Conducting research and analysis on emerging medical technologies - Collaborating with internal teams to align partnership strategies and initiatives - Representing the company at industry events and networking opportunities

Coursework Support Centre (CSC), London, UK
NOV 2011 - MAR 2012

ENGINEERING MATHEMATICS TUTOR
Responsibilities: Developing and delivering effective course materials in engineering mathematics - Creating weekly teaching plans and assessments to track student progress - Achieving significant progress in students' grades, with a 100% pass rate

PUBLICATIONS

MDPI Diagnostics Journal — Automatic Segmentation of Pelvic Cancers using Deep Learning: State-of-the-Art Approaches and Challenges (October, 2021)

Frontiers in Oncology Journal — CT-Based Pelvic T1-Weighted MR Image Synthesis Using UNet, UNet++ and Cycle Consistent Generative Adversarial Network (Cycle-GAN) (July, 2021)

International Orthopaedics Journal — Deep learning COVID-19 detection bias: Accuracy through artificial intelligence (May, 2021)

INTERNATIONAL CONFERENCES

ASTRO 2022 — Organs-at-Risk Segmentation on T2-Weighted Magnetic Resonance Imaging Using a TransformerBased Model

ASTRO 2022 — Prediction of Patients at Risk of Pelvic Insufficiency Fractures Following Pelvic Radiothera-

ICR 2022 — Artificial Intelligence for Automatic Segmentation of Organs-at-Risk (OARs) and Gross Tumour Volume (GTV) for Cervical Cancer on Magnetic Resonance Imaging (MRI)

ISMRM 2021 — Synthetic MRI-assisted Multi-Wavelet Segmentation Framework for Organs-at-Risk Delineation on CT for Radiotherapy Planning

ISMRM 2020 — CT-based Synthetic pelvic T1-weighted MR Image Generation using a Deep Convolutional Neural Network (CNN)

Hamlyn Symposium 2019 — Gaze-Guided Assistive Robotic Suite For Patients with Motor Impairment

CERTIFICATES

The Wizardry of artificial intelligence 2.0 (10 CME; 14 Category 1 CPD Credits), International Cancer Imaging Society (ICIS) • **PyTorch for Deep Learning**, UDEMY • **Fundamentals of Deep Learning**, NVIDIA • **AI For Medical Diagnosis**, DEEPLEARNING.AI • **Machine Learning A-Z: Hands on Python and R in Data Science**; UDEMY • **Introduction to Good Clinical Practice (GCP)** (4 CDP Credits), National Institute of Health Research (NIHR)

HOBBIES

• AI & technical blog writing • Photography & graphical design • Travel • Musical instruments • Tennis & swimming

REFERENCES

Available Upon Request