

## SUMMARY

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My main interest lies at the intersection of 3D Computer Vision and SLAM. My favourite applications are Augmented Reality (AR) and Autonomous Driving, which both require a deep understanding into spatial computing. I am a self-motivated team player and I always seek to improve.

## EMPLOYMENT

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- **VIRNECT** Seoul, South Korea  
*Computer Vision Research Engineer (Full-time)* Apr. 2019 - Present
  - Developed camera pose estimation algorithms in the [VIRNECT TRACK](#) SDK.
  - Implemented prototype AR applications in the [VIRNECT TRACK](#) SDK.
  - Designed and built an automatic test & benchmark system integrated in development process.
  - Developed a visual tracking module used for R&D projects.
  - Responsible for internal computer vision theory seminars
- **McKinsey & Company** London, UK  
*Market Research (Part-time)* Oct. 2017 - Dec. 2017
  - Lead student researcher in AI & Robotics market research.

## PROJECTS

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- **VIRNECT TRACK SDK (Ongoing)**  
Cross-platform AR SDK comprised of camera pose estimation features using Image and QR codes.
  - Responsible for improving robustness in computer vision algorithm implementations.  
**Key achievements:**
    1. Improved feature matching inlier rate by 2x using a better outlier removal method.
    2. Increased object detection rate by 20% via pre-training on synthetically generated images.
    3. Improved tracking stability by 30% using multi-hypothesis line-based tracking.
  - Implemented the following prototype features:
    1. Keyframe-based 3D object detection & pose estimation
    2. Model-based pose estimation & tracking
    3. Visual area localization
  - Built a test & benchmark system in CI/CD, which measures performance and checks for critical bugs.
- **Visual-SLAM with Object Detection (Ongoing)**  
Visual-SLAM with optimisation for reprojection errors of reconstructed 3D bounding boxes and visual keypoints.
- **Easily Reconfigurable Marker-Based Tool Tracking Module**  
Object pose estimation on a easily reconfigurable marker & camera settings with a novel marker-tooltip calibration.
  - Project 1 : Real-time AR welding guidance system
  - Project 2 : Remote AR guidance using tools and hand gestures.
- **Hyperspectral Wide-field Endoscopic Image Registration and Structure-from-Motion**  
3D reconstruction from multi-fibre hyperspectral images - An attempt for biomedical SLAM for cancer mapping.
- **Mobile Rover for Environment Mapping and Survivor Detection in Disaster Scenarios**  
Voice-controllable rover, using RGB-D SLAM, object detection, and collision-avoidance - 1st Prize winner in Hackathon.

## SKILLS

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- **Programming** - C++, Python, MATLAB
- **Frameworks** - OpenCV, COLMAP, Eigen, GTSAM
- **Collaboration** - Git, Docker, JIRA

## EDUCATION

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- **Imperial College London** London, UK  
*M.Res. Medical Robotics and Image-Guided Intervention (Merit)*  
Oct. 2017 – Sept. 2018
  - Course representative, Journal club lead
- **University of Warwick** Coventry, UK  
*B.Eng. Manufacturing and Mechanical Engineering (Upper-Second Class Hons.)*  
Oct. 2014 – Jun. 2017
  - Course representative, University ambassador

## RESEARCH EXPERIENCES

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- **Cavendish Laboratory, University of Cambridge** Cambridgeshire, UK  
*Visiting Researcher (Advisor: Dr.Sarah Bohndiek)*  
Jan. 2019 – Mar. 2019
- **Surgical Imaging and Biophotonics Laboratory, Imperial College London** London, UK  
*M.Res Student Researcher (Advisor: Prof.Daniel Elson)*  
Jan. 2018 – Sept. 2018
- **HARMS Lab, Imperial College London** London, UK  
*M.Res Student Researcher (Advisor: Dr.George Mynolas)*  
Oct. 2017 – Dec. 2017
- **Trace Metals in Medicine Laboratory, University of Warwick** Coventry, UK  
*B.Eng Student Researcher (Advisor: Dr.Joanna Collingwood)*  
Oct. 2016 – Jun. 2017
- **International Institute for Product and Service Innovation, WMG** Coventry, UK  
*B.Eng Student Researcher (Advisor: Mr.Graeme Knowles)*  
Oct. 2016 – Jun. 2017

## CONFERENCE TALKS

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- **MODUCON 2019** 2019
  - Evaluating customer-focused metrics for developing robust computer vision systems using deep learning
- **PyCon APAC 2019** 2019
  - Robot development with Python (Lightning talk)
- **NVIDIA Jetson Meetup** 2019
  - NVIDIA Jetson Nano for intelligent robot development

## COMMUNITY

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- **Community Leader** 2019 – Present  
*Kakao community - “We will become SLAM Masters”*
- **Tech Blogs** 2019 – Present  
*Computer vision and SLAM blogs*
  - [New cv-learn blog](#)
  - [Old cv-learn blog](#) - Notion Awards 2020 Nominee, 100+ daily views.
- **Industry Seminar** 2019 – 2020  
*Samsung, HANCOM Academy, HANCOM InSpace, Neubility, J.MARPLE*
- **Charity Webinar** 2019 – 2020  
*Youtube webinar - tutorial on object pose estimation, tutorial on visual-SLAM*
- **Study Group Lead** 2019 – 2020  
*MODU Labs - Group Study*
  - Visual-SLAM implementation
  - Medical imaging and image-guided intervention
- **Community Translation** 2018 – 2019  
*Book translation: “Introduction to Visual-SLAM”*