Pieter **De Backer**

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As an engineer with 3 years of surgical experience in residency, I lead the AI department at Orsi Academy. Background in micro-electronics, computer vision and 3D modeling. Actively enabling image guidance and computer vision in the robotic surgical workflows. Father of Suzan and husband of Tine.

LANGUAGES

Dutch
French (C1)
English (C2)
Spanish (A2)
German (A2)

FINITE ELEMENT SOFTWARE

Abaqus
Simpleware
Mimics, 3Matic
Fusion 360, Netfabb
AutoCAD, SolidWorks
Cura, MatterControl
3DSlicer, Mimics

PROGRAMMING

Matlab
Python
Pytorch
TensorFlow
Linux
JAVA
HTML
Joomla
LaTeX
Clewin
Ms. Office
Maple

INTERESTS

Travelling,
Technology,
Football/Futsal,
Snowboarding,
Triathlon,
3DPrinting

Education

Current **Master of Medicine in Specialist Medicine: Urology**
2018 - 2019: Resident General Surgery @ OLV Ziekenhuis Aalst-Asse-Ninove
2019 - 2020: Resident Urology @ AZ Sint-Blasius Dendermonde
2020 - 2023: Resident Urology @ Ghent University Hospitals

PhD programme: Biomedical Engineering and Medical Sciences
Development of computer vision algorithms in uro-oncologic robotic procedures to enable precision surgery. Expertise in Deep Learning techniques.

2018 **M.D. - Master of Medicine** (Magna Cum Laude), VUB, campus UZ Brussels

2015 **Bachelor of Science in Medicine** (Cum Laude), VUB, campus UZ Brussels
Webmaster at local Belgian Medical Students' Association (BeMSA)

2013 **Master of Science: Biomedical Engineering** (Cum Laude)
Specialization in micro-electronics, Ghent University & VUB
Master thesis: Design and Fabrication of a Tunable Artificial Iris *(see publication list)*

2012 **Exchange semester at EPFL - Swiss Federal Institute of Technology in Lausanne**

2011 **Bachelor of Science: Mechanical and Electro-technical Engineering** (Cum Laude), Ghent University
Bachelor project: Design and production of a Foucault brake

2008 **Secondary School: Mathematics and Sciences,** DvM Humaniora Aalst
Mathematics Valedictorian

Awards

2022 **Fonds voor Innovatie en Klinisch Onderzoek** , grant for the development of patient-specific 3D modelling at Ghent University Hospital. Ranked first out of 18 projects

2021 **Audience award Belgian Association of Urology,** for poster on 3D clamping strategies in robot-assisted partial nephrectomy

2020 **Abundance 360 scholarship**

2020 **VLAIO Baekeland Mandate,** individual PhD Grant in collaboration with Orsi Academy

2017 **Hamlyn Winter School Travel Grant,** Imperial College London
VLIR UOS Travel Grant for collaboration at Bolivian Prosthetics Foundation

2015 **Jozef Plateau prize** for "Design and Fabrication of a Tunable Artificial Iris", site
Yearly award for the best master thesis of the Faculty of Engineering and Architecture UGent
Flanders Transition Fellowship for research at the Mechanobiology lab, Cape Town
Award 'Medische Wereld' VUB for research at the Mechanobiology lab, Cape Town: site, video.

2013 **Shortlist Vlaamse Scriptieprijs** for "Design and Fabrication of An Artificial Iris": video

Experience

2020 - … **Artificial Intelligence Lead – Orsi Academy**

At Orsi Academy, Europe's largest training centre for robotic surgery, I set up the activities involving artificial intelligence in robotic surgeries. I obtained an independent individual grant of the Flemish Government to start this AI lab and currently lead a team of 3 engineers, project managers and 6 junior MDs to enable the use of artificial intelligence in robotic surgery training and teaching. I report directly to the CEO. I am responsible for several other collaborative projects on the operating theatre of the future with budgets >1M€.

2016 - … **Co-founder PrintPlace 3D Printing; R&D and product development**

PrintPlace.be aims to leverage 3D Printing providing consumers easy access to personalised objects. I focus on medical 3DPrinting. Amongst others, we printed patient-specific carotid artery molds for validation of biomechanical simulations, pre-operative kidney and pulmonary vein models, dosimetry phantoms, … My focus is the design and automation of new 3D printing techniques allowing easy integration into clinical practice while significantly reducing costs.

2015 - 2016 **Mechanobiology Lab - University of Cape Town & Ibitech - Ghent University,**

Collaboration on finite element analysis of patient specific cardiac models. Started of programming an automated classification and metadata extraction tool for large cardiac MRI datasets. Next, researched the best way to implement boundary conditions for numerical simulations of a beating human heart. We provide a framework for future mechanical modeling by defining a standard of boundary conditions, thus facilitating clinical integration.

"Kinematic boundary conditions substantially impact in silico ventricular function", Numerical Methods in Biomedical Engineering Vol 35, Issue 1, January 2019

2017 **Bolivian Prosthetics Foundation,** internship

Volunteered for the 'Bolivian Prosthetics Foundation FunProBo' in La Paz to make free prostheses for impoverished amputees. Optimization of the 3D printing process for the production of artificial hands. Tripling of the average output and giving 3 patients a primitive active opponing finger grip by means of personalized 3D printed hands.

2017 - 2016 **Clinical internships**

Neurosurgery, Cardiology, Rehabilitation Medicine, Ophthalmology, Otolaryngology, Dermatology, Radiology, Family Medicine, Urology, Cardiac Surgery, Gynecology, Pediatrics, Gastro-enterology, Oncologic Surgery

Summer 2014 **B-PHOT - Brussels Photonics Team,** internship

Design and fabrication of an interferometric setup using Digital Optical Phase Conjugation to obtain focused light out of a multimode optical fiber used for micro-endoscopes with 200 micron fiber diameter.

Summer 2013 **P&G - Global Go To Market Engineering,** internship

Investigation of opportunities for increased automation in the global production line of Head and Shoulders

2013-2012 **CMST + EPFL - Development and Fabrication of a Tunable Artificial Iris,** Master project

Spent 4 months in the Renaud lab at EPFL and 4 months in the De Smet lab at CMST. Investigation of patient groups benefitting from an artificial iris contact lens, reviewing most suitable technology platform, design and cleanroom fabrication of an artificial iris contact lens by use of a curved liquid crystal display. Electro-optical characterization and programming to physiologically mimic the human iris.

Final Thesis Result (video) - read about it online here (Dutch)

< 2012 Various student summer jobs such as teaching, maintenance technician, administrator, …