

# Raluca-Maria Sandu

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## EXPERIENCE

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### Machine Learning Engineer and Team Lead | Accenture

Zurich, Switzerland

June 2022–current

- Developed and led PoCs using AI & ML, managed international teams of stakeholders, facilitated technical workshops, and ensured alignment with business strategies for timely and measurable project outcomes.
- Implemented generative AI diffusion (diffusion, NeRFs, transformers) models to generate novel 3D designs.
- Built a multimodal generative AI (VLMs, diffusion, SAM) pipeline employing training, finetuning, and optimization techniques for creation of marketing materials.
- Created and taught a two-month Design & Marketing course on using Generative AI tools for beginners.
- Applied computer vision models for object detection in industrial settings, reducing manufacturing costs.

### PhD Researcher | University of Bern

Bern, Switzerland

May 2017–May 2022

- Collected, processed, analyzed large scale patient data from varying sources to research liver cancer therapies.
- Led the integration of AI/ML methods within multidisciplinary teams of clinicians, product managers and engineers to evaluate cancer ablation treatments part of a retrospective European clinical trial of 100 patients.
- Developed statistics and visualization methods to research and interpret patient health outcomes.
- Implemented a commercial software product deployed in hospitals: [www.cascination.com/en/ablasure](http://www.cascination.com/en/ablasure).
- Authored peer-reviewed publications, reports and presented at conferences on the topic of medical interventions.

### Junior Research Scientist | Philips Research

Eindhoven, Netherlands

April 2016–March 2017

- Implemented a front-end web application for image annotation that sped up the data labelling process by 95%.
- Designed and executed a prototype study to assess the visual effect of a diet of antioxidants on 25 participants.
- Developed state-of-the-art image/video processing algorithms for automatic real-time detection and semantic segmentation of dermatology images that achieved 98% classification accuracy with 1 seconds time latency.

## EDUCATION

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### PhD in Biomedical Engineering

University of Bern

Bern, Switzerland

May 2017–May 2022

- Dissertation topic: “Quantitative assessment of ablation treatments for liver tumours – image-based efficacy analysis and predictive modelling”. Awarded Marie Skłodowska-Curie European scholarship, Cum Laude

### Master’s (MSc) in Biomedical Engineering

RWTH Aachen University

Aachen, Germany

Oct 2014–Apr 2017

- Dissertation: “Image Segmentation and Semantic Description: Tools and Analytics” carried at Philips Research.

### Bachelor’s (BSc) in Control Engineering Systems and Computer Science

Politehnica University of Bucharest

Bucharest, Romania

Oct 2010–Jul 2014

- Dissertation: “Volumetric Capnography Respiratory Signals for Spontaneously Breathing Subjects”.
- Awarded maximum grade for dissertation and graduated top 20% out of 400 students.

## SKILLS

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- **AI, ML & Deep Learning:** Image and Signal Processing, Data Visualization, Statistical Software, Regression, Classification, Transformers, LLM (Large Language Models), Diffusion Models, MLOps and DevOps (CI/CD)
- **Python:** Data Science methods, NumPy, Pandas, Scipy, Scikit-learn, OpenCV, Matplotlib, Jupyter, PyTorch
- **R:** RShiny, Tidyverse, ggplot2, lmr, knitr, mlr3
- **Cloud:** AWS (Sagemaker, Bedrock, IAM, CLI, CDK), Microsoft Azure, Google Colab
- **Other:** Git, Bash, Github, Gitlab, MATLAB, C/C++, PyCharm, VSCode, Midjourney, Adobe

## EXTRACURRICULAR ACTIVITIES

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- **Volunteering:** Vice-president IAESTE Student Organization (2020) and member of BEST Student Organization.
- **Career Lunch Volunteering:** Performed 25+ individual workshops coaching students with their CVs and career.

## PUBLICATIONS

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- [1] **R.-M. Sandu**, I. Paolucci, S. J. S. Ruiter, R. Sznitman, K. P. de Jong, J. Freedman, S. Weber, and P. Tinguely, “Volumetric quantitative ablation margins for assessment of ablation completeness in thermal ablation of liver tumours”, *Frontiers in Oncology*, vol. 11, 2021, Publisher: Frontiers, ISSN: 2234-943X. DOI: 10.3389/fonc.2021.623098.
- [2] D. Stillström, **R.-M. Sandu**, and J. Freedman, “Accuracy of electrode placement in ire treatment with navigated guidance”, *CardioVascular and Interventional Radiology*, 2021, ISSN: 1432-086X. DOI: 10.1007/s00270-020-02762-5.
- [3] I. Paolucci, J. Hermann, **R.-M. Sandu**, D. Candinas, P. Tinguely, and S. Weber, “Robotically customizable thermal ablation volumes”, in *IEEE Engineering in Medicine and Biology International Student Conference (EMBISC)*, Magdeburg, Germany, Oct. 2019.
- [4] I. Paolucci, **R.-M. Sandu**, L. Sahli, G. A. Prevost, F. Storni, D. Candinas, S. Weber, and A. Lachenmayer, “Ultrasound based planning and navigation for non-anatomical liver resections — an ex-vivo study”, *IEEE Open Journal of Engineering in Medicine and Biology*, 2019, ISSN: 2644-1276. DOI: 10.1109/OJEMB.2019.2961094.
- [5] I. Paolucci, **R.-M. Sandu**, P. Tinguely, C. Kim-Fuchs, M. Maurer, D. Candinas, S. Weber, and A. Lachenmayer, “Stereotactic image-guidance for ablation of malignant liver tumors”, in *Liver Cancer*, IntechOpen, Oct. 2019. DOI: 10.5772/intechopen.89722.
- [6] **R.-M. Sandu**, I. Paolucci, J. Freedman, P. Tinguely, S. J. S. Ruiter, and S. Weber, “Quantitative volumetric assessment of percutaneous image-guided microwave ablations for colorectal liver metastases”, in *31st Conference of the International Society for Medical Innovation and Technology (iSMIT)*, Heilbronn, Germany, Oct. 2019.
- [7] **R.-M. Sandu**, I. Paolucci, J. Freedman, P. Tinguely, and S. Weber, “Quantitative volumetric assessment of ct-guided ablation treatments for colorectal liver metastases”, in *IEEE Engineering in Medicine and Biology Society (EMBS) International Student Conference (ISC)*, Magdeburg, Germany, Nov. 2019.