

TITLE	
Format 3 : Thesis with company project within a company proposed by: Barco, Kortrijk	
<i>(Title:) Self learning strategies in healthcare to generate a representable feature space</i>	
GUIDANCE	
• For more information, please contact:	<i>stijn.vandewiele@barco.com</i>
• Academic promotor: (name)	
• Supervisor and daily advisor(s) in the company: (name) (name)	Jonas De Vylder
	Bart Diricx
	Stijn Vandewiele
• Number of students	1
CONTEXT	
<p>Although AI has a tremendous potential in healthcare applications, progress in the R&D phase is constrained due to limited access to high quality annotated datasets. Anonymized, unlabelled datasets on the other hand are typically more abundant. This data can be leveraged to generate a broadly applicable representable feature space, agnostic of the final application (classification, segmentation, identification...). In a second step a more dedicated feature space can be distilled, tailored to the use-case.</p>	
GOAL	
<p>Research the best approach to leverage self learning techniques to generate a representable feature space for medical image-based datasets, taking the challenge of unbalanced datasets into account. In a next phase the feature space will be tweaked further for a specific medical relevant use-case.</p>	
METHODOLOGY	
<p>From literature the most adequate self-learning network and approach is chosen, and applied to Barco's medical image-based datasets. In an iterative way, dataset balancing is taken into account. In a last step the generated feature space is tested against use-cases such as segmentation where AI generability and out-of-distribution detection performance are evaluated.</p>	
PROFILE/REQUIRED SKILLS (e.g. rather theoretical / rather practical implementation, required knowledge (courses, methods, computer language(s), etc.)	

Software: python, pytorch and/or tensorflow, git
Skills: AI, ML, data analysis, cluster analysis, model training, model evaluation, big dataset handling
Affinity with medical datasets is highly appreciated

COVID-19: In case additional restrictions are put into place by the government because of COVID-19, can the student continue the internship online? If adjustments to the project are needed in such a case, please specify these adjustments.

Online continuation is possible

REFERENCES

Barco
Barco designs technology that makes everyday life a little better. Seeing beyond the image, we develop sight, sound, and sharing solutions to help customers work together, share insights, and wow audiences. Healthcare is one of the key markets of Barco. For many years Barco has been contributing to improved healthcare by means of solutions in radiology, mammography, surgery, dermatology, dentistry, pathology etc.

Innovation in healthcare
The Barco Labs Healthcare team is constantly looking for new innovative solutions that push forward the state-of-the-art and can improve healthcare models. This group takes care of the entire innovation cycle: ideation and MVP definition, market evaluation and business case creation, R&D and clinical work for creation of proof of concepts and solutions, market and clinical / regulatory validation of the solutions, business model and business plan creation, up to commercial introduction and early pilot sales.