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ITEA 3 is a EUREKA strategic ICT cluster programme

Exploitable Results by Third Parties

ITEA 17021 IMPACT

Project details

Project leader:	Robert Hofsink
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Name: Cath Lab Cockpit Dashboard		
Input(s):	Main feature(s)	Output(s):
▪ EMR data ▪ Cath lab device data ▪ Scheduling data	▪ The Cath-lab cockpit displays key clinical information and alerts relevant to the procedure, patient and phase. ▪ The Cath-lab allows for seamless communication with the Cath lab team leader/ day coordinator	▪ A dashboard user interface showing relevant information intended to be displayed on a wall-mounted screen inside each Cath lab ▪ HL7 messages containing status updates from individual Cath labs, intended to be consumed by a system in use by the cath lab team leader/ day coordinator such as an overview dashboard or control tower

Unique Selling Proposition(s):	▪ Real time integration of multiple data sources ▪ Display of data according to algorithms intended to turn raw data into actionable information ▪ Real time communication with day coordinator
Integration constraint(s):	▪ Requires HL7 interfacing with EMR, scheduling and other sources ▪
Intended user(s):	▪ Cath lab clinicians
Provider:	▪ NewCompliance
Contact point:	▪ Robin.steenhagen@newcompliance.com
Condition(s) for reuse:	▪ Commercial license – single cost + yearly service fee

Latest update: 12 Sep 2021

Name: Cath lab efficiency DataWarehouse		
Input(s):	Main feature(s)	Output(s):
▪ Data from EMR ▪ Data from scheduling ▪ Data from Cath lab devices	▪ Integrating data from disparate sources ▪ Data cleansing ▪ Transforming data ▪ Arranging data to optimize for efficiency analysis	▪ Data warehouse with data from multiple sources which has been arranged to allow for optimal data mining, online analytical processing and decision support in the area of Cath lab department efficiency

Unique Selling Proposition(s):	▪ Data warehouse is optimized for efficiency analytics for the Cath lab. No other commercially available dataware house is optimized for this purpose ▪
Integration constraint(s):	▪ Requires interfacing with EMR, Scheduling & devices to collect data ▪ Requires analytics tool such as PowerBI or Tableau to run analyses
Intended user(s):	▪ Cath lab department admins, hospital data analyst
Provider:	▪ NewCompliance
Contact point:	▪ Robin.steenhagen@newcompliance.com
Condition(s) for reuse:	▪ Commercial license – single cost + yearly service fee ▪

Latest update: 12 Sep 2021

Name: Cath-lab Operational Control Tower		
Input(s):	Main feature(s)	Output(s):
▪ Workflow model ▪ Procedure schedules ▪ Workflow trigger events	▪ Display patient flows (their current stages in the workflow) ▪ Display workflow progress in current stages ▪ Display delay warnings	▪ Visualization of plan and status ▪ Workflow record
Unique Selling Proposition(s):	▪ Pathway-oriented end-to-end workflow visibility provides transparency and improves information sharing ▪ Early warnings about delays improve awareness and facilitate timely reaction	
Integration constraint(s):	▪ Workflow event types are declared in the workflow model ▪ Real-time events are registered via GraphQL HTTP calls.	
Intended user(s):	▪ Cath-lab care professionals (e.g., coordinator)	
Provider:	▪ Philips	
Contact point:	▪ Hongchao Nie	
Condition(s) for reuse:	▪ Subject to licence costs or through commercial/research partnerships	
	Latest update: 27-July-2021	

Name: Digital checklist		
Input(s):	Main feature(s)	Output(s):
▪ Checklist template ▪ Patient information ▪ Workflow state	▪ Smart, interactive list of important tasks to be checked ▪ Ad-hoc checklist items on-the-fly	▪ Record of checklist execution ▪ Calibrated progress tracking (displayed on the control tower)

Unique Selling Proposition(s):	▪ Dynamically generated, patient-specific digital checklists enhance safety awareness and reduce probability of accidental ommission of essential workflow steps ▪ Each checklist item is associated with the processing time the task needs, based on which progress and remaining time can be estimated ▪ Users have the freedom to add checklist items on-the-fly allowing added flexibility
Integration constraint(s):	▪ Checklist template declared using YAML format ▪ Integration with the Control Tower display via GraphQL
Intended user(s):	▪ Cath-lab care professionals (e.g., nurses)
Provider:	▪ Philips
Contact point:	▪ Hongchao Nie
Condition(s) for reuse:	▪ Subject to licence costs or through commercial/research partnerships
	Latest update: 27-July-2021

Name: Procedure Day Planner		
Input(s):	Main feature(s)	Output(s):
▪ Pathway templates ▪ Resource specifications ▪ Resource optimization criteria ▪ Patient-procedure list	▪ Interactive display of potential resource conflicts for manually created schedules ▪ Automatic schedule generation using optimization ▪ Schedule quality score	▪ Resource conflict warnings ▪ Auto-generated optimized schedules ▪ Export workflow scenario script
Unique Selling Proposition(s):	▪ Pathway-based deep scheduling brings confidence ▪ Early alerts for potential disruptions later in the day ▪ Smart algorithm to find optimized schedules automates tedious work	
Integration constraint(s):	▪ Apple iOS	
Intended user(s):	▪ Cath-lab care professionals (e.g., coordinator, scheduler)	
Provider:	▪ Philips	
Contact point:	▪ Eltjo Hasselhoff	
Condition(s) for reuse:	▪ Subject to license costs or through commercial/research partnerships	
	Latest update: 27-July-2021	

Name: Scripted Workflow Execution Playground		
Input(s):	Main feature(s)	Output(s):
▪ Workflow scenario design ▪ Patient flow script	▪ Load the scenario script and display the timeline ▪ Manual and automatic modes to execute the scenario script	▪ Display of Control Tower

Unique Selling Proposition(s):	▪ A simple but effective fast prototyping tool to design and study various workflow scenarios ▪ Replay record from the past allows for improvement scenario analysis
Integration constraint(s):	▪ Workflow scenario follows pre-defined YAML format
Intended user(s):	▪ Cath-lab IT professionals
Provider:	▪ Philips
Contact point:	▪ Eltjo Hasselhoff
Condition(s) for reuse:	▪ Subject to license costs or through commercial/research partnerships
	Latest update: 27-July-2021

Name: Medical image analysis		
Input(s):	Main feature(s)	Output(s):
▪ MR images ▪ fMRI images ▪ dMRI images	▪ Segmentation of brain tumors ▪ Generation of synthetic images ▪ Analysis of brain activity in white matter	▪ Segmentations ▪ Synthetic images ▪ Brain activity maps

Unique Selling Proposition(s):	▪ Fast and automatic segmentation of brain tumors ▪ Generation of synthetic images from noise (progressive GAN 3D) or from other images (3D CycleGAN) ▪ Analysis of brain activity in white matter by combining functional MRI and diffusion MRI
Integration constraint(s):	▪ Needs deep learning packages such as Tensorflow and/or Keras installed, see each repository ▪
Intended user(s):	▪ Medical imaging researchers
Provider:	▪ Linköping University
Contact point:	▪ Anders.eklund@liu.se
Condition(s) for reuse:	▪ Code is open source and available at different github repositories ▪ https://github.com/wanderine/BrainTumourSegmentationqMRI ▪ https://github.com/wanderine/ProgressiveGAN3D ▪ https://github.com/DavidAbramian/CycleGAN ▪ https://github.com/DavidAbramian/DSS ▪ https://github.com/mdciri/Vox2Vox ▪ https://github.com/mdciri/3D-augmentation-techniques ▪ https://github.com/IulianEmilTampu/bts_anatomical_context_info ▪
	Latest update: 12 Sep 2021

Name: Software for analysing diffusion MRI (dMRI) data		
Input(s):	Main feature(s)	Output(s):
▪ dMRI images ▪ Data with general tensor encoding	▪ Determining structure of the brain and other organs ▪ Multiple image contrasts	▪ Several quantitative maps such as microscopic anisotropy and size variance
Unique Selling Proposition(s):	▪ Computation of quantitative images through acquisitions performed within clinically-acceptable times ▪ Accurate estimates of tissue structure and contrast sensitive to various pathologies	
Integration constraint(s):	▪ Requires an external optimization tool such as MOSEK or SDPT3	
Intended user(s):	▪ Medical imaging researchers	
Provider:	▪ Linköping University	
Contact point:	▪ evren.ozarslan@liu.se	
Condition(s) for reuse:	▪ Code is available upon request and will be made available via github subject to terms of the license.	
	Latest update: 12 Sep 2021	

Name: Liver and liver tumour segmentation in CT		
Input(s):	Main feature(s)	Output(s):
▪ CT image	▪ Automated segmentation of the liver and liver tumors packaged in a portable Docker container	▪ Liver segmentation ▪ Tumor segmentation
Unique Selling Proposition(s):	▪ Automated liver segmentation can be used in many use cases: o To improve registration of pre – inter and post procedure images o To assess metabolic syndrome and fatty liver disease o Estimate dose for radioembolization treatment o Liver volume is a decisive factor to decide for surgical treatment ▪ Liver tumor segmentation aids in treatment planning and allows for radiomics which can help in tumor characterization. ▪ Fast (< 5 minutes) segmentation algorithm and is robust to variation in CT scanner equipment.	
Integration constraint(s):	▪ DL algorithm is integrated into portable Docker container. ▪ Input can be DICOM or NIFTI, same for output. ▪ Can run on CPU or GPU.	
Intended user(s):	▪ Radiologist / Radio therapy planning / Interventional Radiologist	
Provider:	▪ Quantib	
Contact point:	▪ Ronald van ‘t Klooster <r.vantklooster@quantib.com>	
Condition(s) for reuse:	▪ Licensing ▪ Research partnership	
	Latest update: 12 Sep 2021	

Name: Personalized liver lesion detection in follow-up exams		
Input(s):	Main feature(s)	Output(s):
▪ Dynamic contrast-enhanced MR sequence of liver ▪ Diffusion-weighted MR ▪ Both acquired at min. two time points	▪ Automatic detection of liver lesions in follow-up scan(s) ▪ Improved performance by inclusion of patient-specific image data	▪ Accurate, automatic annotations of lesions in liver MRI
Unique Selling Proposition(s):	▪ Automatic detection of liver lesions in follow-up MR scan(s), for better monitoring of disease progress and treatment response ▪ Improved performance by inclusion of patient-specific image data (a fine-tuning training step of a deep learning network based on prior patient data)	
Integration constraint(s):	▪ stand-alone package	
Intended user(s):	▪ Medical imaging researcher ▪ Radiologist	
Provider:	▪ University Medical Center Utrecht	
Contact point:	▪ Josien Pluim (j.pluim@umcutrecht.nl)	
Condition(s) for reuse:	▪ Code is research SW and can be made available upon request	
	Latest update: 12 Sep 2021	

Name: FEops HEARTguide LAAo		
Input(s):	Main feature(s)	Output(s):
▪ Preoperative Cardiac CT scan (DICOM file)	▪ Simulate the intervention on a specific patients' heart using combinations of possible device sizes and implantation positions	▪ 3D view and report illustrating the intervention outcomes associated to specific combinations of device sizes and positions

Unique Selling Proposition(s):	▪ The sizing chart of LAAo devices often leaves the physician the choice among multiple device sizes. Engineering simulations help selecting the optimal procedure for a specific patient (i.e. device size and implementation position) that minimizes intervention time, radiations, contrast and risk of expensive device wasting.
Integration constraint(s):	▪ Simulations need to be performed remotely: anonymized patient data (DICOM file) need to exit the hospital through internet connection.
Intended user(s):	▪ Cardiologists, electrophysiologist, medical imaging companies, medical device companies (e.g. LAAo device manufacturers)
Provider:	▪ FEops
Contact point:	▪ Matthieu De Beule <matthieu.debeule@feops.com>
Condition(s) for reuse:	▪ Cost per case or commercial license (to be negotiated) or research license. ▪ Patent application pending.
	Latest update: 12 Sep 2021