and injection parameters as input. Thus, as opposed to traditional methods, the Reflux method inherently relies on, and is robust against, these hemodynamic disturbances. Refinement of the technique is needed to improve the accuracy and precision for clinical use.

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E-162 OPTIMAL PROJECTION ANGLE PLANNING TOOL FOR C-ARM IN AUGMENTED REALITY

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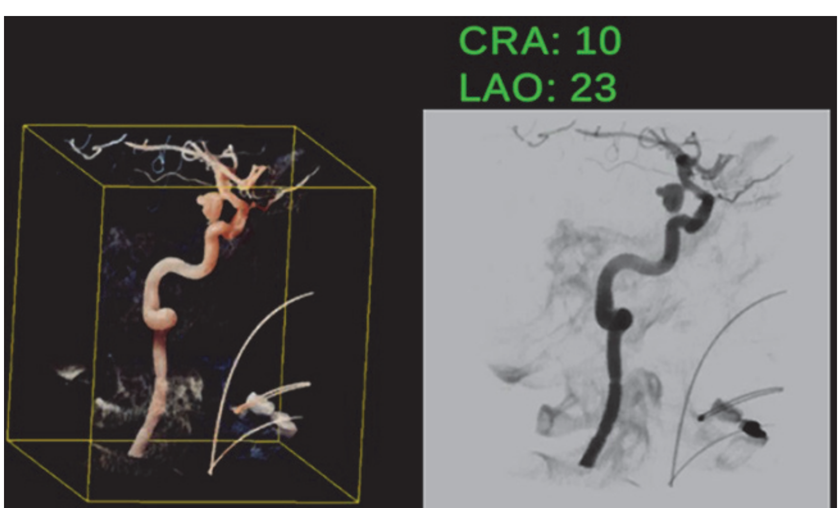
Introduction Acquiring images at an optimal projection viewing angle during a neurointerventional procedure is important to get proper view of aneurysms, avoid vessel foreshortening, obtain accurate measurements, and perform proper vessel cannulations. In some cases, the interventionalist may look for the appropriate view under fluoroscopy by acquiring multiple projection images. This radiation exposure can be avoided by using an interactive planning software that allows manipulation of a volumetric image. This abstract describes a novel method in which the interventionalist uses wearable augmented reality (AR) device to manipulate the volumetric image and select the view that best suits the procedure stage. The AR software generates the appropriate c-arm angle and indicates whether the angle is achievable by the c-arm.
Objective To provide the interventionalist a fast and intuitive way to manipulate volumetric images in order to select the best viewing angle while avoiding radiation exposure to scout for the best view.
Method An AR platform was developed to render volumetric data on wearable AR headset (Hololens2 Microsoft, Redmond WA). Hand gestures, eye gaze and voice control were provided as means to interact with 3D-rendered volumetric acquisition. A digitally reconstructed radiograph (DRR) in the direction of the physicians eyes was displayed in the headset next to the volumetric rendering. The corresponding C-arm angle was displayed above the DRR. Knowing the forward kinematics of the C-arm gantry (ceiling mounted Allura FD-20, Philips, NL), the color of the text changes based on whether the angle is achievable. A pre-op cone beam computed tomography (CBCT) image was acquired during a pre-clinical study. The interventionalist was presented with the volumetric rendering and asked to rotate the image to find the desired view. They were able to select the best viewing angle which was achievable by the gantry.
Results The interventionalist was able to achieve the desired angle without additional fluoroscopy and while remaining in the sterile field. The DRR provided a preview of what image to expect when the C-arm was moved to the calculated angle.
Conclusion Augmented reality provides a new interaction paradigm in the interventional suite. Articulated hand tracking proves to be an intuitive way to rotate and move the virtual content while remaining in the sterile field. Providing the C-arm angle to achieve the desired x-ray view has a potential to reduce radiation exposure during a procedure.
Disclosures A. Panse: 5; C; Philips Research. **M. Flexman:** 5; C; Philips Research. **B. Mory:** 5; C; Philips Research. **P. Webb:** 5; C; Philips Research. **P. Keenan:** 5; C; Philips Research.



Abstract E-162 Figure 1 Rendering captured from unity depicting volume rendered data on the left rotated to view the desired anatomy, and corresponding DRR on the right. The C-arm angles to achieve the DRR and displayed above the DRR

E-163 A METHOD FOR AUTOMATIC ELOQUENCE EVALUATION IN ACUTE STROKE NEUROIMAGING

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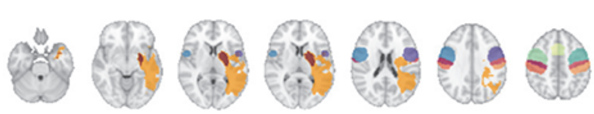
The current state of the art neuroimaging in patients with acute stroke presenting 6–24 hours after symptom onset includes CT or MRI perfusion sequences for delineating volumes of the core infarct and ischemic penumbra. These imaging derived volumes together with clinical neurological symptom severity are the parameters driving the decision for endovascular therapy in the 6–24 hour time window for large vessel occlusion. As per current AHA guidelines no consideration is taken for the eloquence of the tissue at risk.

Here we show an original machine learning method using perfusion MRI for predicting the expected motor improvement of reperfusing the tissue at risk in acute stroke. The ISLES 2015 data set which included diffusion and perfusion MRI as well as expert delineated core infarct and ischemic penumbra in 30 patients with acute stroke was used to train a Convolutional Neuroal Network model. The model output label maps indicating core infarct and ischemic penumbra. These maps were subsequently transformed into standard MNI space and overlaid onto a probabilistic map of motor regions. Percent overlap with primary motor, premotor and supplementary motor areas were calculated for the core infarct and ischemic penumbra. External technical performance was evaluated using clinical acute stroke MRI exams from our institution. The model derived volumes closely resembled those of the commercial RAPID software for these patients. Visual examination of the standard MNI space maps showed good anatomical alignment and correspondance of the motor areas. A software prototype generating an automatic report was developed (figure 1).

The results show good technical performance of the Convolutional Neural Network model on acute stroke MRI on an

Functional stroke report

Patient name: test_UCLA



AREA	Core Volume(mL)	Core %	Penumbra Volume(mL)	Penumbra %
Primary motor	0.0	0.0	0.0	0.0
Premotor	0.0	0.0	1.1	2.3
Supplementary motor	0.0	0.0	0.0	0.0
Total	7.0	n/a	97.5	n/a

Abstract E-163 Figure 1 Automatically generated report using a patient with acute stroke, independent from the training sample. Red indicates the core infarct and yellow indicates ischemic penumbra. The probabilistic location of the three motor areas are also displayed

independent data set. The degree of core infarcts and penumbra involvement of anatomical motor areas could be rapidly calculated using regular commercial computer hardware. Further investigation with a prospective clinical study is required for testing the clinical efficacy and possible improvement in clinical outcome prediction using the model.

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E-164 INTRAPROCEDURAL MRI DURING ACUTE ISCHEMIC STROKE INTERVENTION CAN GUIDE DECISION FOR INTRACRANIAL STENTING

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Introduction Intracranial atherosclerotic disease (ICAD) is sometimes discovered during mechanical thrombectomy for acute ischemic stroke. In the event of partial or failed recanalization, termination of the procedure is typically determined by interpretation of the angiogram. Although some retrospective studies have suggested that rescue intracranial stenting is safe and effective in this setting, others have suggested that intracranial stenting may increase risk of intracranial hemorrhage. In difficult cases that result in partial or failed recanalization, MRI would be helpful to definitively discriminate viable from infarcted cerebral tissue and determine operative course.

Methods We performed a retrospective single institution review of all acute stroke patients who underwent thrombectomy and intraprocedural MRI. From October 2019 to March 2020, eight patients underwent intraprocedural 3 Tesla MRI during mechanical thrombectomy for acute ischemic stroke intervention in a hybrid angiography-MRI suite. Diffusion-weighted (DWI; b-value=1000 s/mm^2) and T2-weighted sequences were obtained. The electronic medical record was reviewed to determine clinical outcomes.

Results In all cases, the intraprocedural MRI was obtained to determine the extent of core infarct, and played a pivotal role in decision-making. In particular, operators used the MRI to make decisions regarding intracranial stent placement, administration of antiplatelet medications or heparin, and blood pressure parameters. p { margin-bottom: 0.1in; line-height: 115%; background: transparent } In four patients who underwent partial recanalization (TICI 2a or less), intracranial stents were placed in 2 based on MRI results. In the remaining patients, MRI informed the time course for postoperative initiation of anticoagulant medications and blood pressure parameters.