

# Weak labels for DL-based detection of brain aneurysms from MR angiography scans

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## BACKGROUND

Visual detection of aneurysms: **hard and time-consuming**<sup>1</sup>

SOTA methods all **DL-based**<sup>2</sup>

Problems for clinical application



Expensive voxel-wise labels



Only one open-access dataset<sup>3</sup>

1. Nakao et al., 2018, JMRI

2. Di Noto et al., 2022, Neuroinformatics

3. Timmins et al., 2021, Neuroimage

## MATERIALS & METHODS: 4 CONTRIBUTIONS

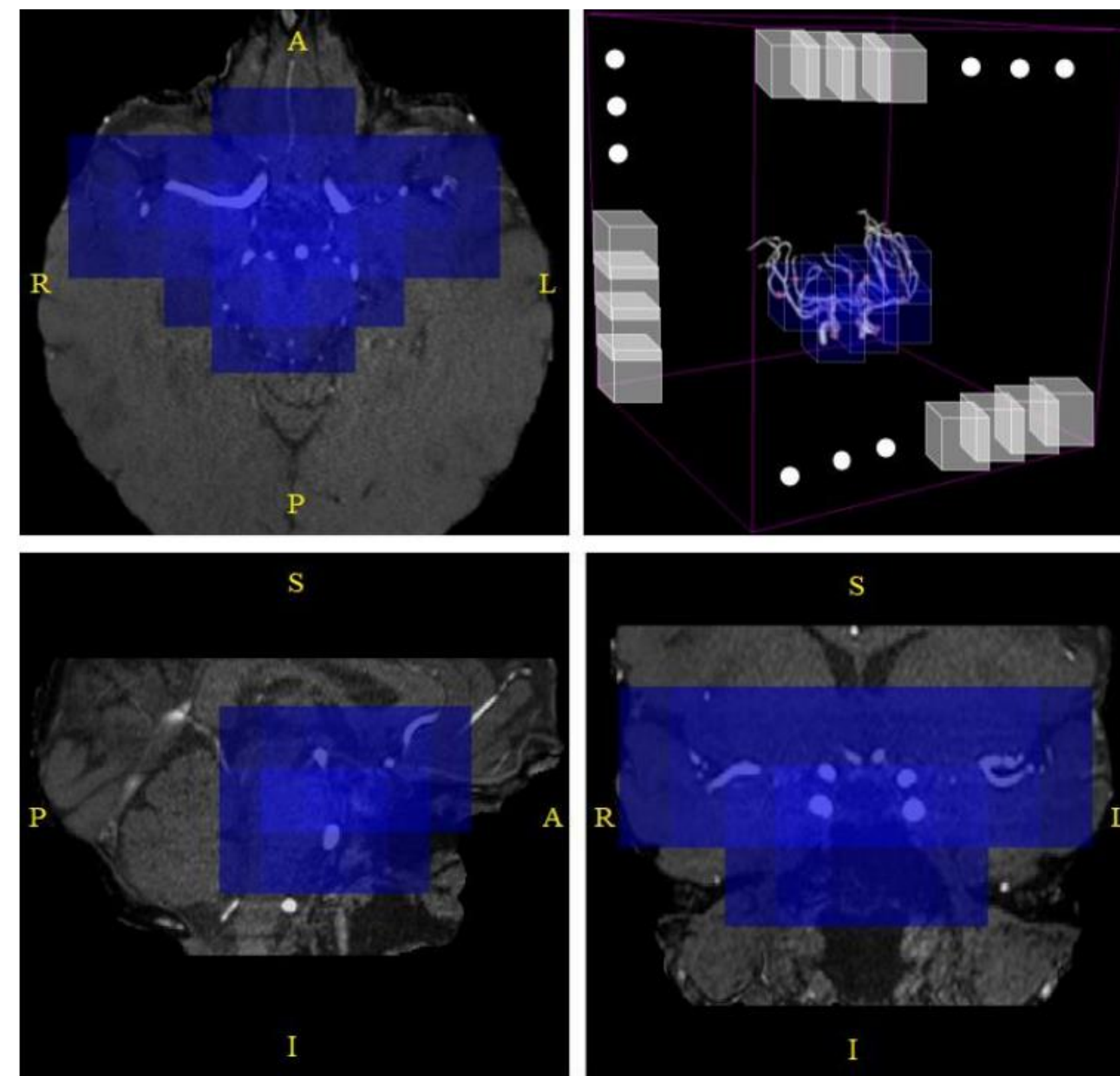
1. Use of weak labels: **spheres**

2. Release of in-house dataset:

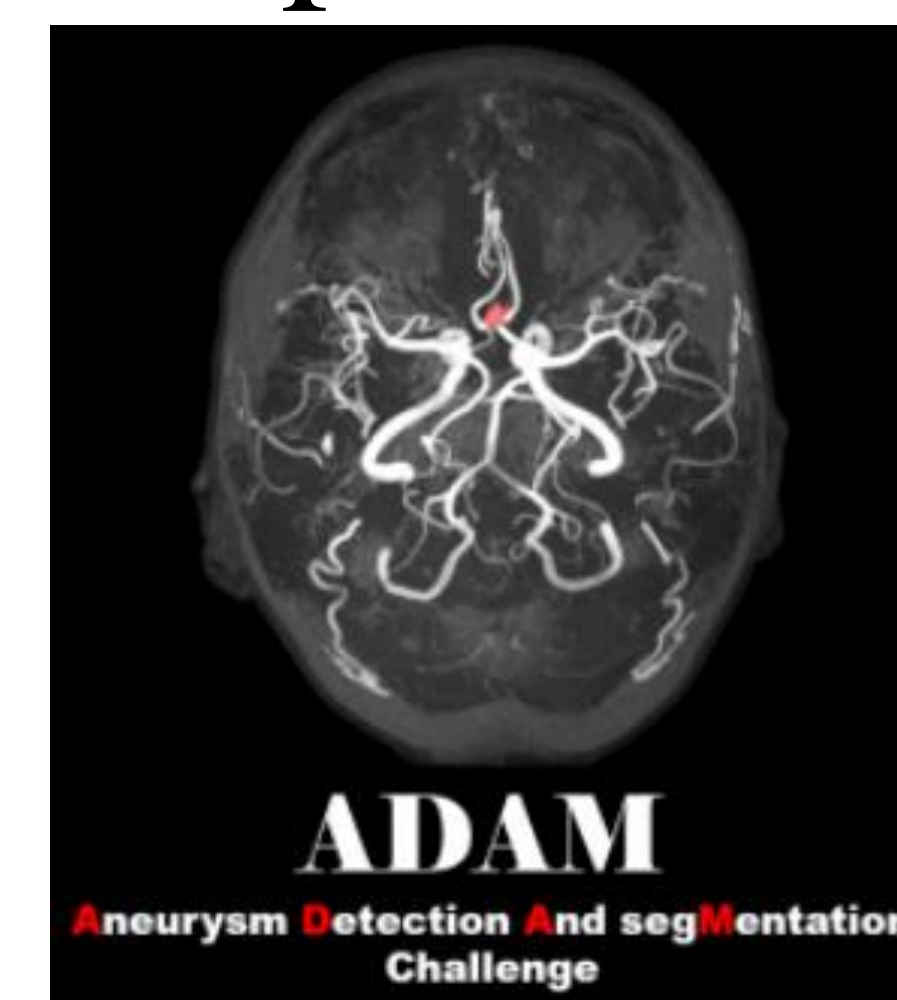
**284 TOF-MRA subjects**



3. Use of **anatomical knowledge**



4. Participation to **ADAM challenge**

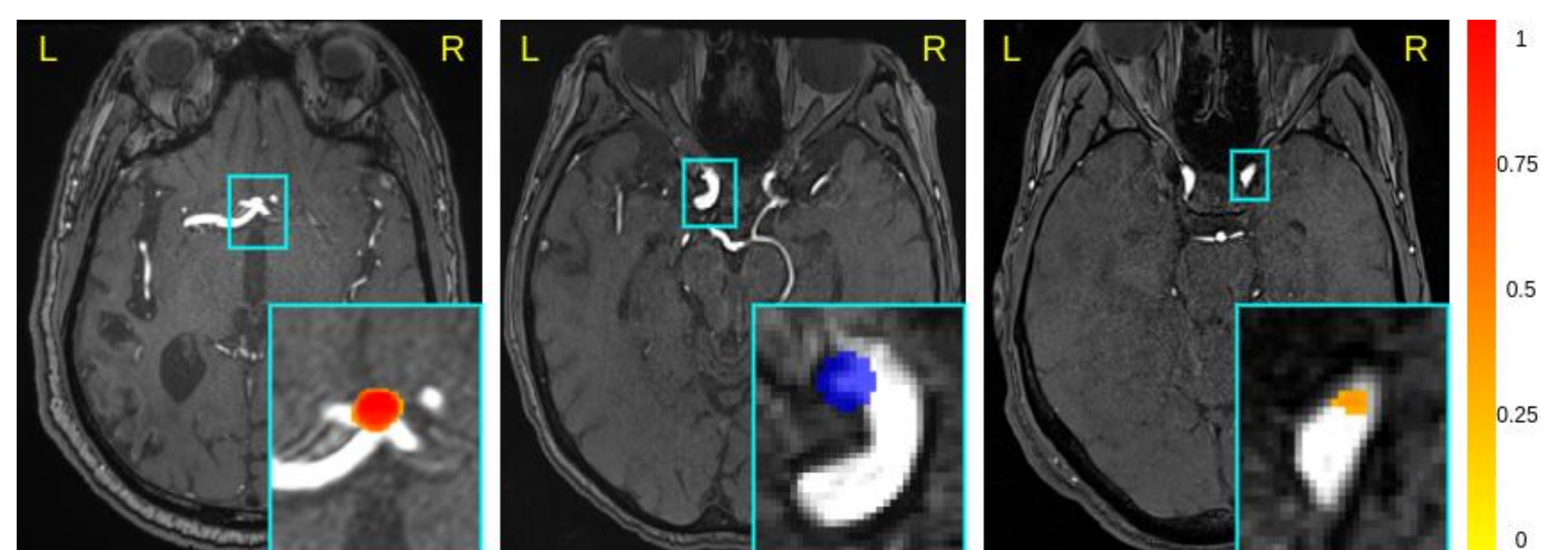


## RESULTS

**In-house dataset**

**ADAM : rank 4th/18, Sens = 68%, FP rate = 2.5**

Model Configuration	Labels of 38 added subs	Avg. Sensitivity	Avg. FP rate
Model 1	38 weakened	75%	1.3
Model 2	19 weakened, 19 voxel-wise	78%	<b>0.9</b>
Model 3	38 voxel-wise	<b>80%</b>	1.2



True positive

False Negative

False Positive