

# Medical Imaging Workshop Challenge

Magnetic Resonance Images and Computed Tomography Images

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# Motivation

- High number of medical imaging acquisitions
- The data quality assessment still has many steps performed manually
  - Checking if the image is correctly named (according to the exam modality)

# Challenge

- The challenge is divided into two parts: a **multiclass** classification, and a multi-label part.
- Multiclass classification consists of 5 different tasks:
  - Modality classification: MR image or CT image
  - MR sequence classification: T1, T2, T2-star, FLAIR, or Diffusion-weighted imaging (DWI),
  - CT Angiography classification: Noncontrast (NCCT) or contrast (CTA)
  - Vendor classification: GE, Siemens, Philips or Toshiba
  - For MRI
    - Magnetic Field strength classification : 1.5T or 3T
    - Acquisition plane classification: sagittal/coronal/axial

# Challenge

- The challenge is divided into two parts: a multiclass classification, and a **multi-label** part.
  - Multi-label classification part:
    - Modality: MR image or CT image
    - MR sequence: T1, T2, T2-star, FLAIR, or Diffusion-weighted imaging (DWI),
    - Noncontrast or contrast (for CT images)
    - Vendor: GE, Siemens, Philips or Toshiba
    - Magnetic Field strength classification : 1.5T or 3T (for MR images)
    - Acquisition plane classification: sagittal/coronal/axial (for MR images)



# Dataset

- The dataset is comprised of 717 stroke patients. There are 563 MR exams (22876 images) and 164 CT exams (23411 images)

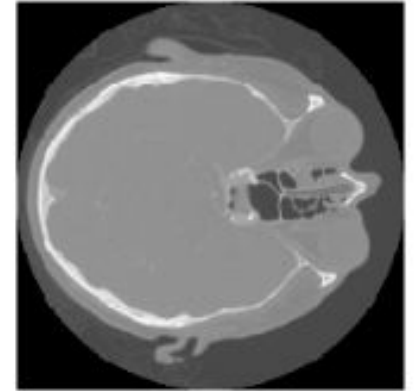
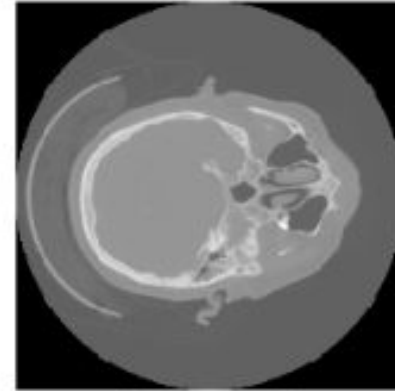
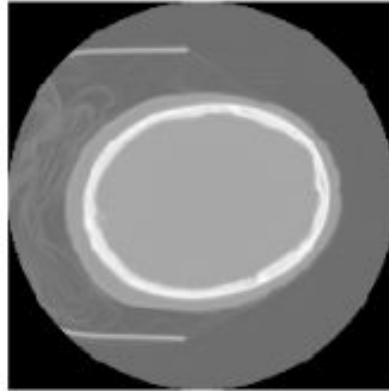
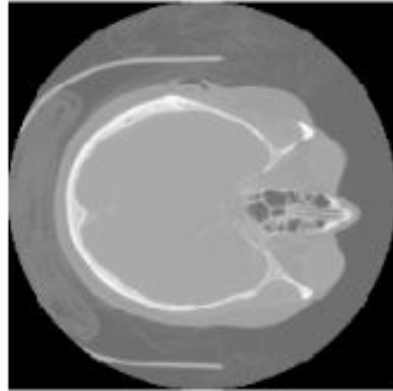
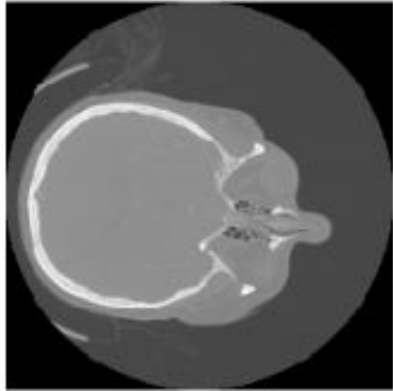
MRI						
	GE		Philips		Siemens	
	1.5	3	1.5	3	1.5	3
DWI	19	23	8	23	20	23
T1	18	20	11	17	21	29
T2	17	27	12	15	30	26
FLAIR						
R	24	24	13	23	29	23
GRE	14	14	8	12	10	4

CT				
	GE	Philips	Siemens	Toshiba
CTA	23	25	16	23
NCCT	21	21	21	14

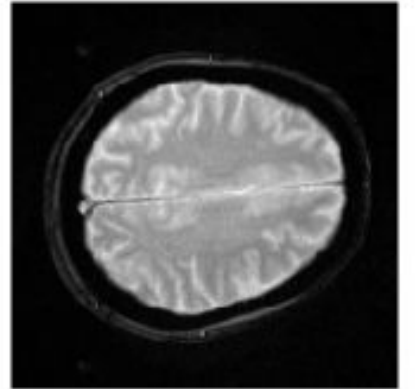
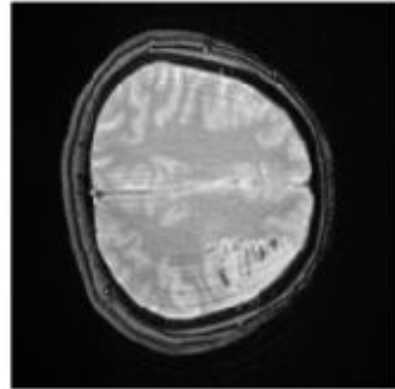
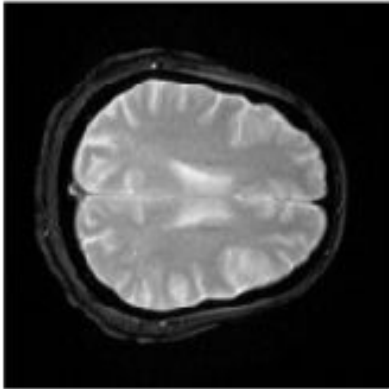
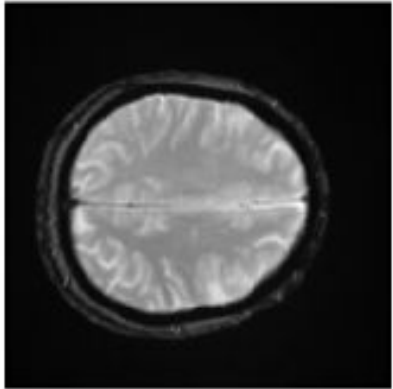
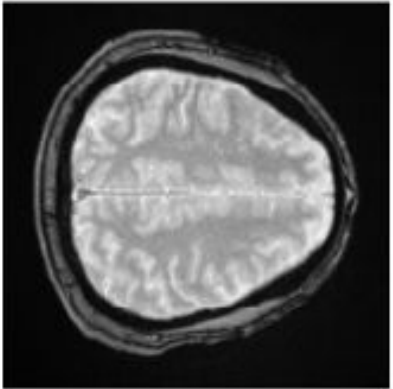
id	CT	MR	GE	Siemens	Philips	Toshiba	CTA	NCTT	T2W	T1W	DWI	FLAIR	GRE	1_5	3	AX	SAG	COR
name_image	0	1	1	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0

# Visualizing The Dataset

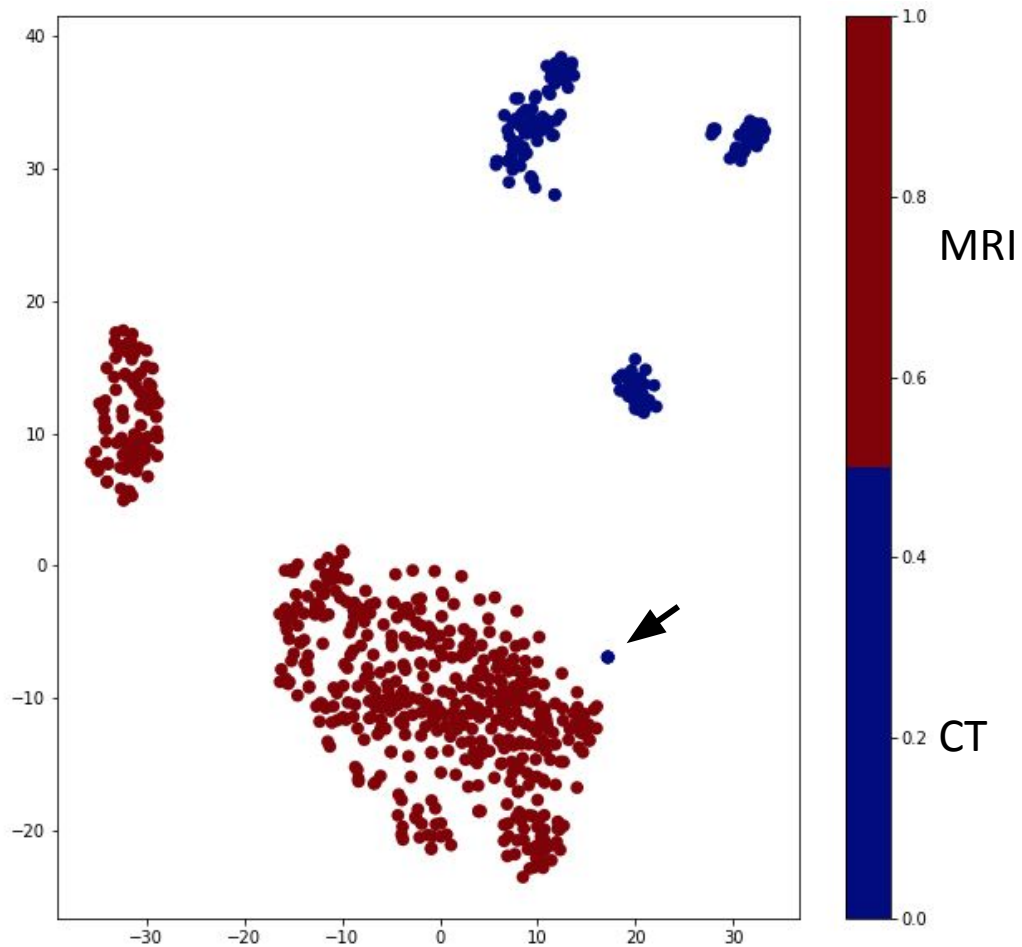
CT



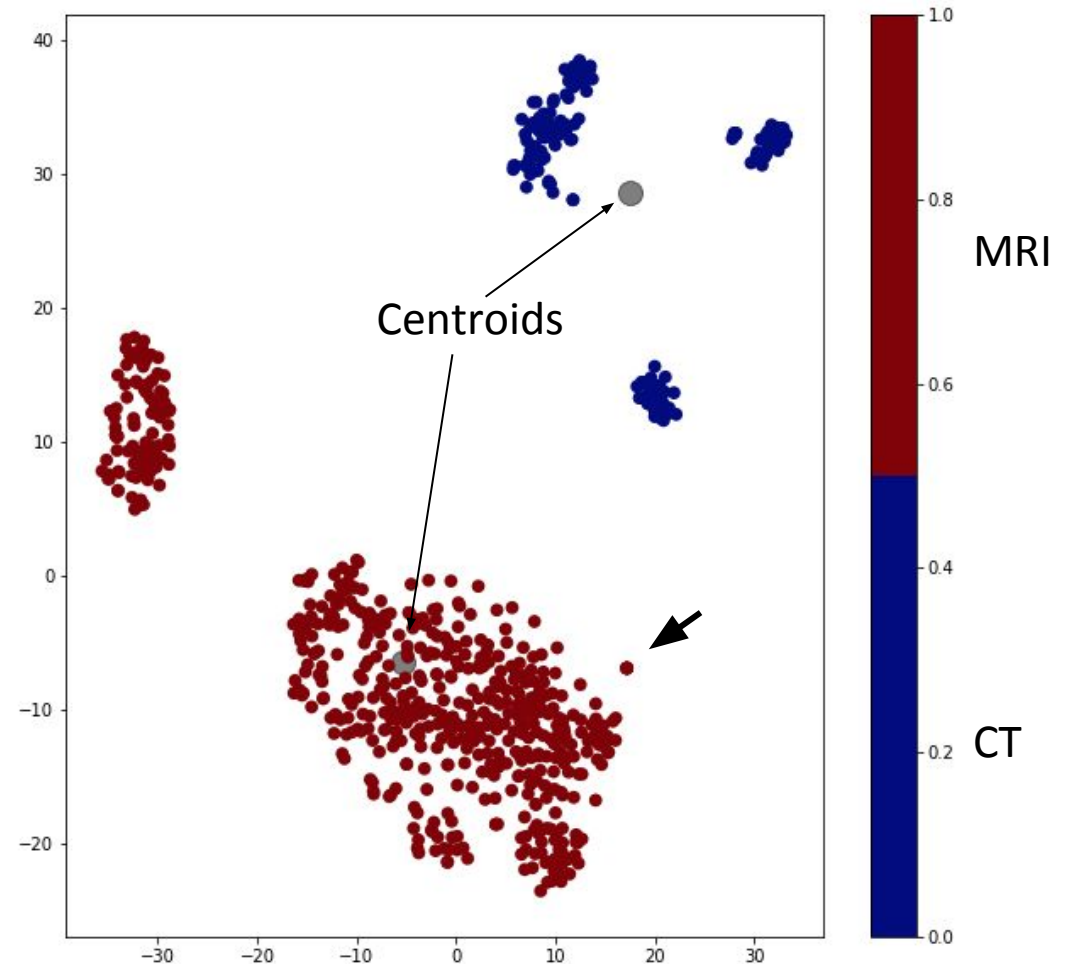
MRI



# Visualizing The Dataset



t-Distributed Stochastic Neighbor Embedding (**t-SNE**)



Kmeans (acc): 0.993122

# Infrastructure

- The challenge is supported by the AWS Cloud Credits for Research. For each team a cloud computer instance will be provided to develop their solutions.





# Call for Abstracts



- All teams are welcome to write an abstract to ISMRM. The authors of the abstract would be the members of the team and the organizing committee members of this challenge