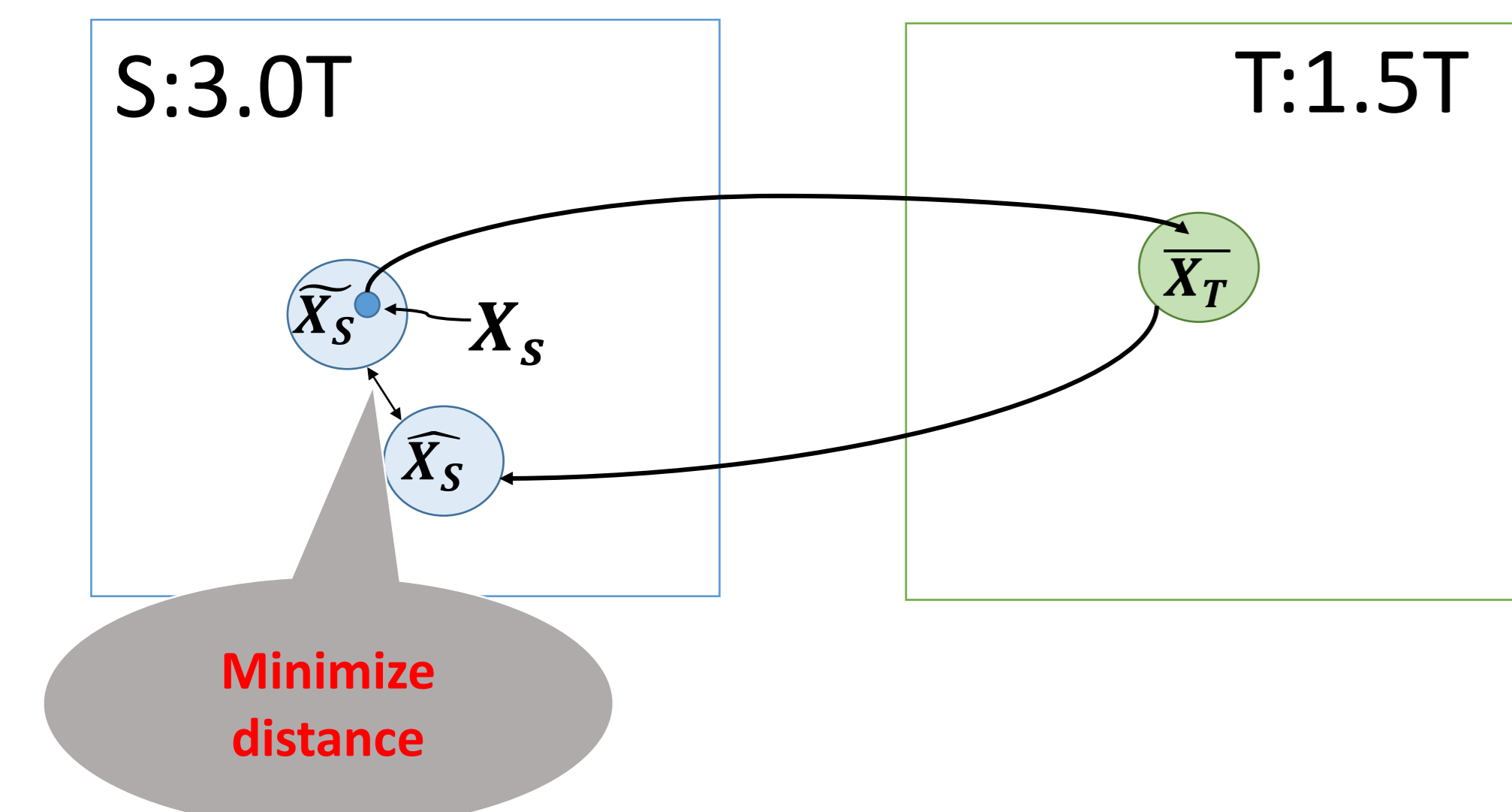


INTRODUCTION

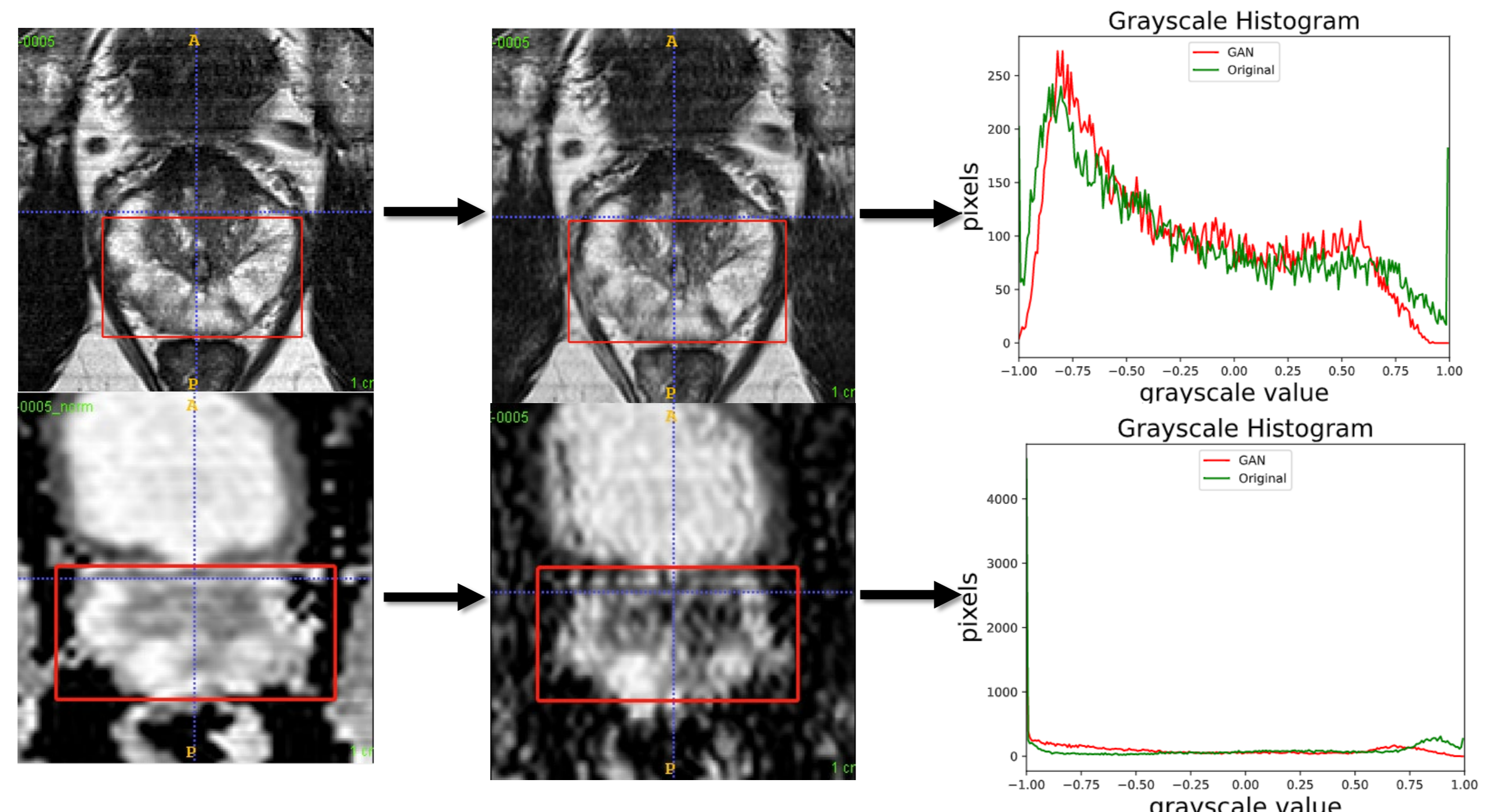
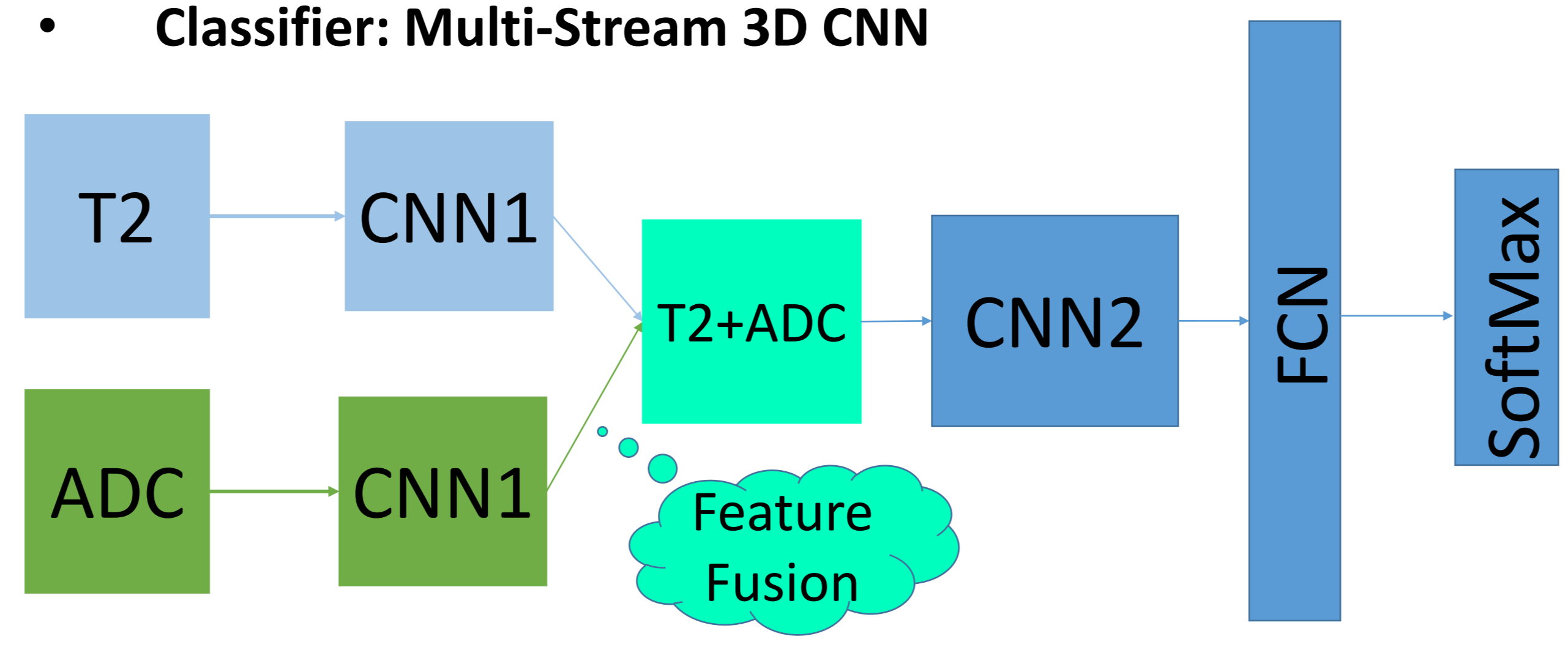
- Prostate Cancer (PCa)** is one of the most common types of cancer among males. Magnetic Resonance Imaging (MRI) is one of the effective ways to detect PCa in the early stages
- 1.5T MRI data is often used in clinical center. However, with low patient throughput in local hospital, training a deep learning-based model on 1.5T MRI is infeasible.
- 3.0T MRI data is used in research settings and may be acquired by different equipment and protocols, so it could not directly be used together with 1.5T MRI



- Deep learning-based** approach to detect PCa is popularized by a large group of researchers
- Generative Adversarial Network (GAN)** demonstrates an outstanding performance in the Image Translation and Reconstruction tasks

Objective: we proposed a framework to translate 3.0T MRI data to 1.5T-like MRI data and then use a 3D-CNN to classify the clinically significant PCa

MATERIALS & METHODS

- Data Collection**
 ProstateX, 3.0T (204 Patients) + Local Data, 1.5T (104 Patients)
 Abnormal: 108, Normal: 319
- Data Preprocessing**

- Classifier: Multi-Stream 3D CNN**


Conclusion: The result demonstrates the feasibility of the domain adaptation in the PCa classification task. Based on the experiments and the reported AUC, the proposed image translation approach could exceed the state-of-the-art performance in PCa classification.

RESULTS

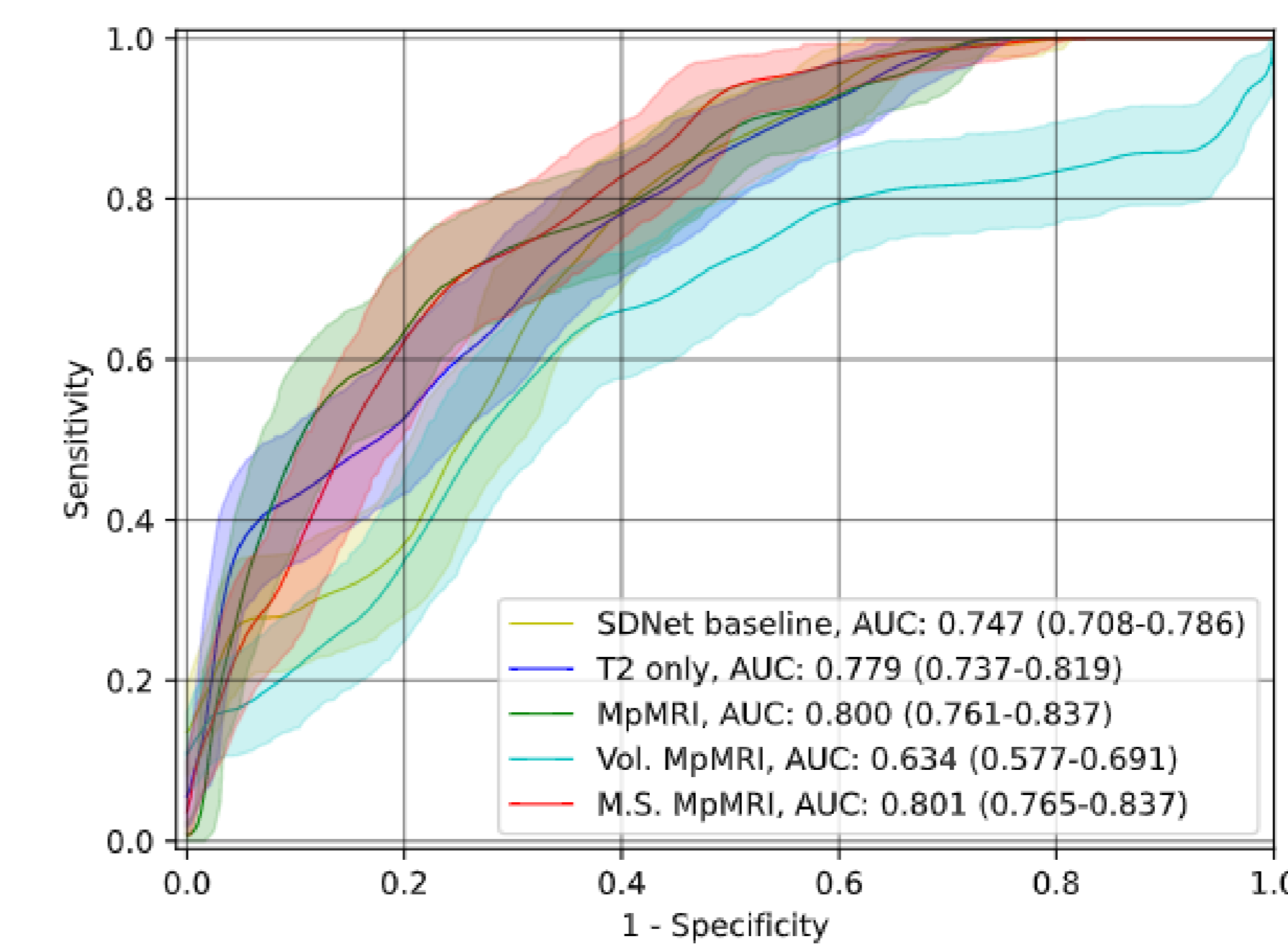
- Quantitative comparison for Patch-based results:**

	Accuracy %	Sensitivity %	Specificity %	AUC %
SDNet(baseline)	77.8	27.9	90.7	74.8
T2-only	65.6	75.7	63.0	77.9
MpMRI	75.1	69.3	76.7	79.9
Vol. MpMRI	64.9	62.9	65.4	63.5
M.S. MpMRI	70.4	74.3	69.4	80.2

- Quantitative comparison for Patient-level results:**

	Accuracy %	Sensitivity %	Specificity %	AUC %
SDNet(baseline)	79.4	28.6	92.6	76.2
T2-only	64.7	71.4	63.0	77.8
MpMRI	79.4	85.7	77.8	84.7
Vol. MpMRI	67.6	71.4	66.7	68.9
M.S. MpMRI	73.5	71.4	74.1	82.5

- Visualization of the AUC curve for Patch-based results:**



- Recall that the rotation-crop is applied for augmentation. Therefore, the results for patient level is based on the majority voting within each patient

- Robustness of the CNN:**

Selected random 34 patients for patch-based inference

AUC:

