

Motivation

Thin-Slice (1mm)



Thick-Slice (5mm)



Axial

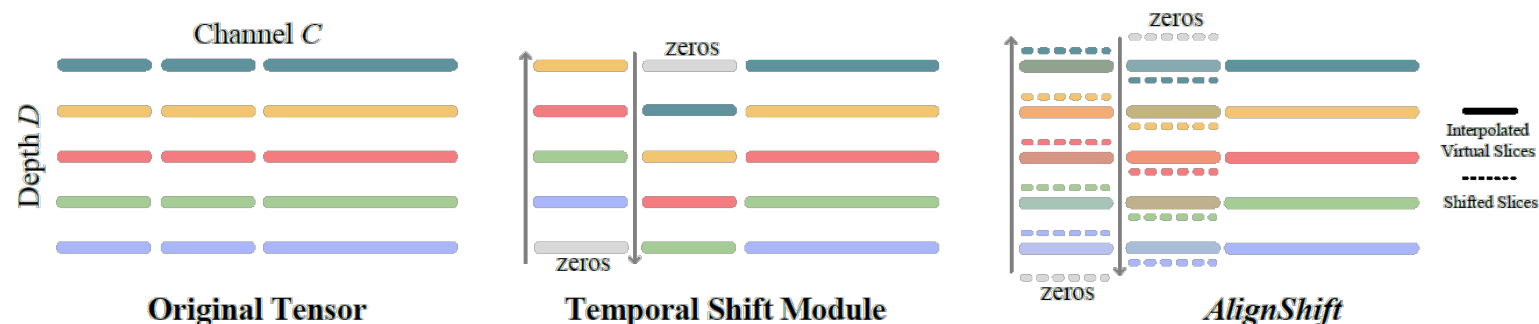
Sagittal

Coronal

Is there a **unified** approach to bridge the **performance gap** between thin- and thick-slice 3D **anisotropic** volumes?

Methodology

Transfer a pretrained 2D network into a **thickness-aware** 3D network via **AlignShift**.



Results

Methods	Slices	0.5	1	2	4	8	16	Avg.[0.5,1,2,4]
3DCE [26] MICCAI'18	×27	62.48	73.37	80.70	85.65	89.09	91.06	75.55
ULDor [23] ISBI'19	×1	52.86	64.8	74.84	84.38	87.17	91.8	69.22
V.Attn [24] MICCAI'19	×3	69.10	77.90	83.80	-	-	-	-
Retina. [35] MICCAI'19	×3	72.15	80.07	86.40	90.77	94.09	96.32	82.35
MVP [13] MICCAI'19	×3	70.01	78.77	84.71	89.03	-	-	80.63
MVP [13] MICCAI'19	×9	73.83	81.82	87.60	91.30	-	-	83.64
MULAN [27] MICCAI'19	×9	76.12	83.69	88.76	92.30	94.71	95.64	85.22
w/o SRL [27] MICCAI'19	×9	-	-	-	-	-	-	84.22
Ours 2.5D	×3	71.27	79.82	86.30	90.61	93.75	95.70	82.00
Ours 2.5D	×7	72.66	81.45	87.07	90.98	93.40	95.30	83.04
Ours TSM	×3	70.24	79.52	86.28	90.90	94.06	96.09	81.73
Ours TSM	×7	75.98	83.65	88.44	92.14	94.89	96.50	85.05
Ours AlignShift	×3	72.90	80.74	87.15	91.92	94.85	96.48	83.18
Ours AlignShift	×7	79.40	85.50	90.09	93.26	95.24	96.66	87.06

AlignShift significantly outperforms previous SOTA on DeepLesion Benchmark, which bridges the performance gap between thin- and thick-slice volumes



上海交通大学
SHANGHAI JIAO TONG UNIVERSITY



AlignShift: Bridging the Gap of Imaging Thickness in 3D Anisotropic Volumes
Jiancheng Yang *et al.* MICCAI 2020.