

AbdomenAtlas

Radiologists and AI Unite to Map the Abdomen

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Johns Hopkins University


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Atlas

Johns Hopkins University



Johns Hopkins University is a private research university in Baltimore, Maryland. Founded in 1876, Johns Hopkins was the first American university based on the European research institution model. The university was named for its first benefactor, the American entrepreneur and Quaker philanthropist Johns Hopkins.

[Wikipedia](#)

Johns Hopkins University, Baltimore, MD 21218

89HH+XQ Baltimore, Maryland

jhu.edu

(410) 516-8000

Acceptance rate
7.3% (2022)

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Baltimore



Baltimore is a major city in Maryland with a long history as an important seaport. Fort McHenry, birthplace of the U.S. national anthem, "The Star-Spangled Banner," sits at the mouth of Baltimore's Inner Harbor. Today, this harbor area offers shops, upscale crab shacks and attractions like the Civil War-era warship the USS Constellation and the National Aquarium, showcasing thousands of marine creatures.

Baltimore, MD

baltimorecity.gov

Population
576,498 (2021)

Area code
Area code 410

Congressional districts
2nd, 7th

Save to project

Atlas





NORTH AMERICA

SOUTH AMERICA

EUROPE

AFRICA

NEW ZEALAND

ASIA

AUSTRALIA

Atlas



Atlas

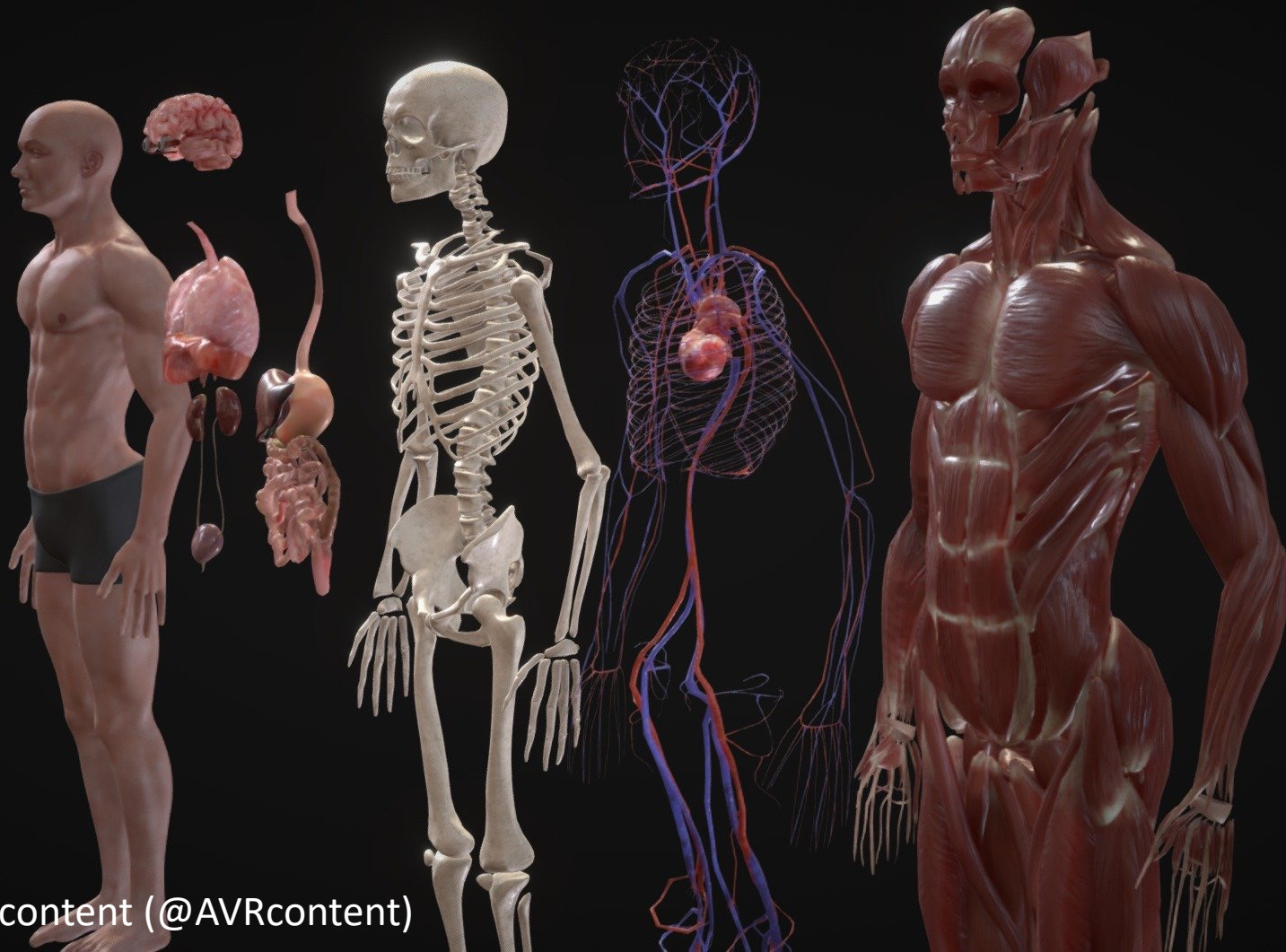
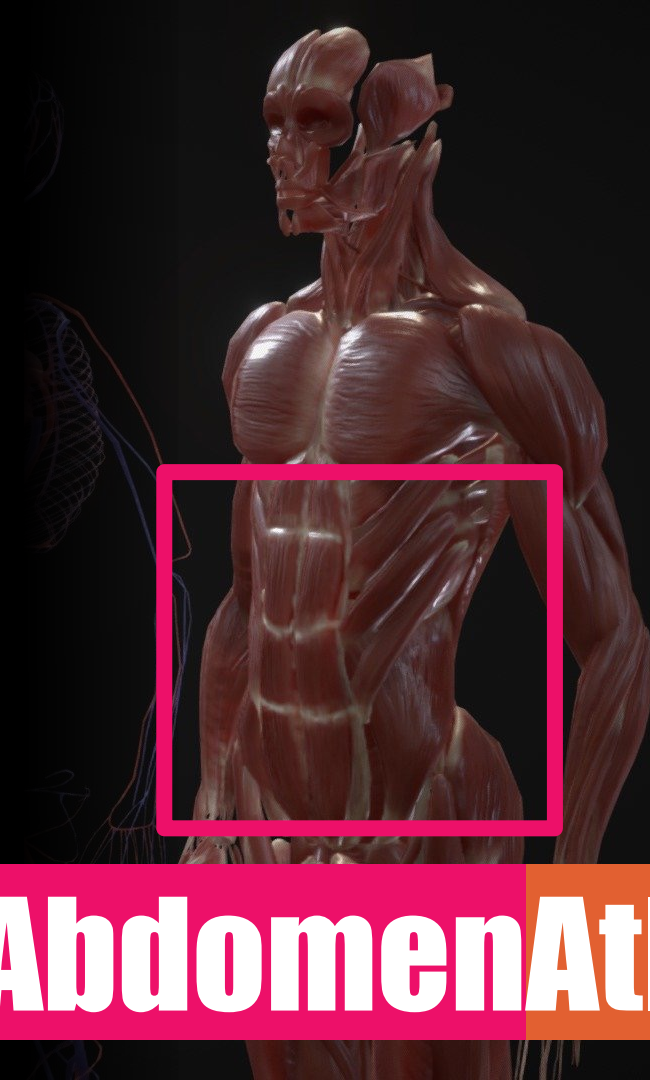
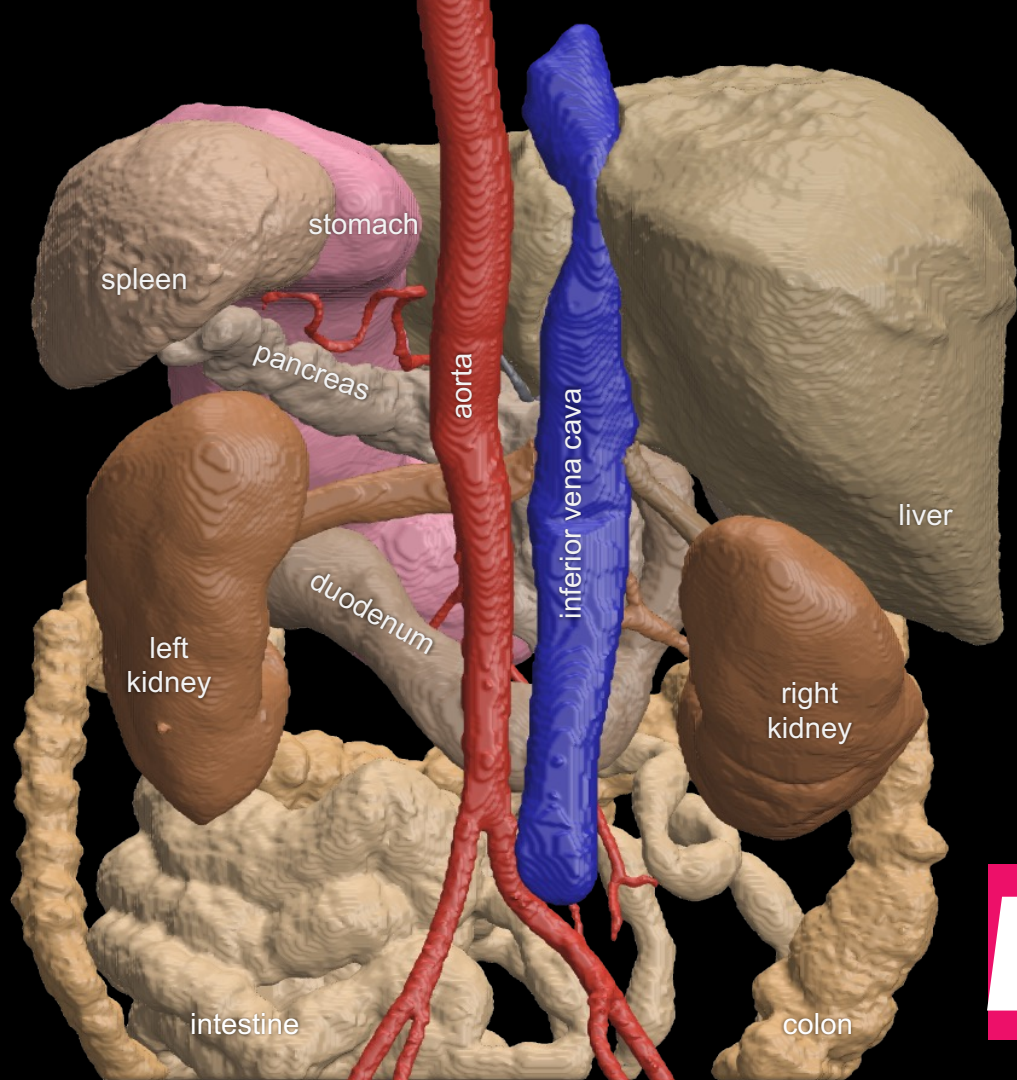
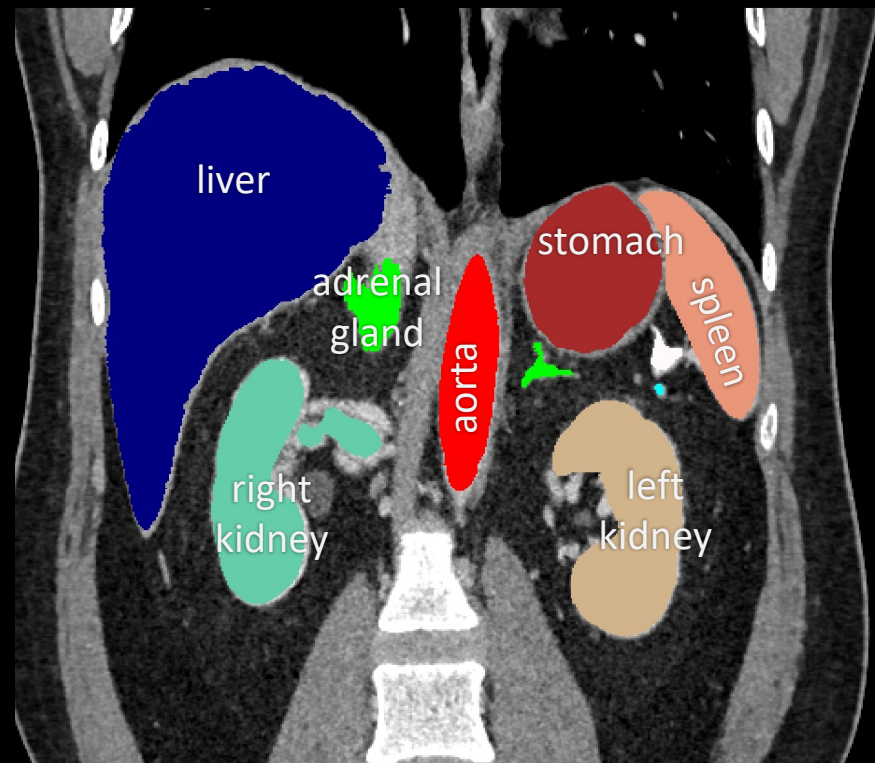
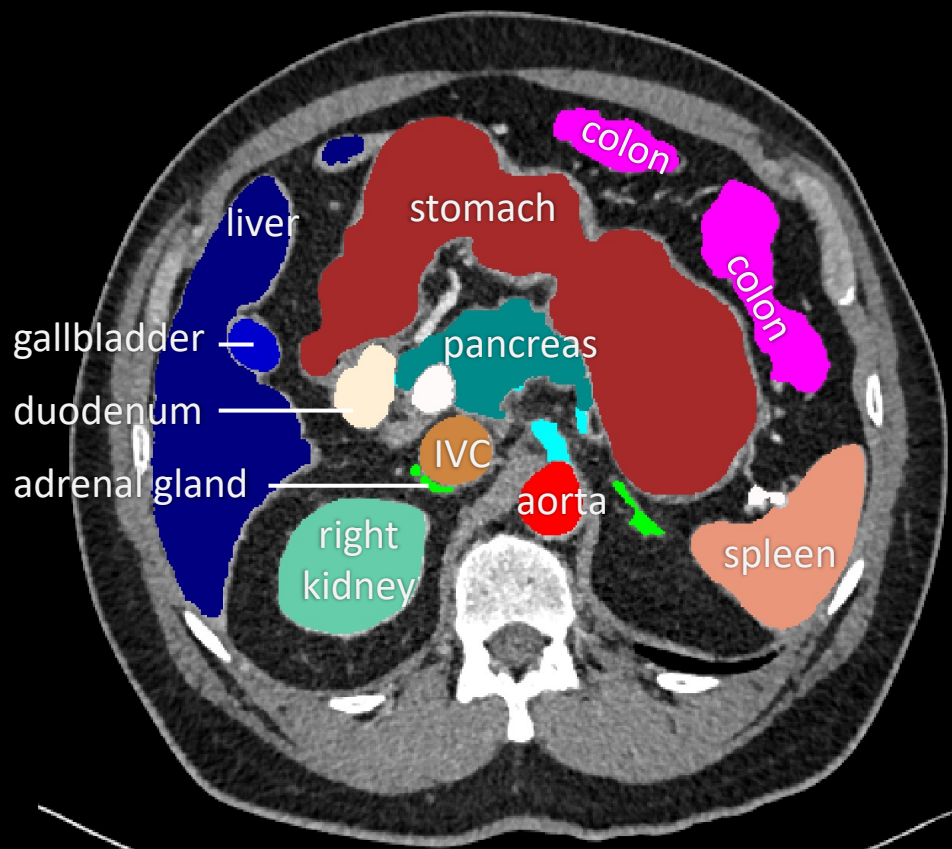


Photo by AVRcontent (@AVRcontent)



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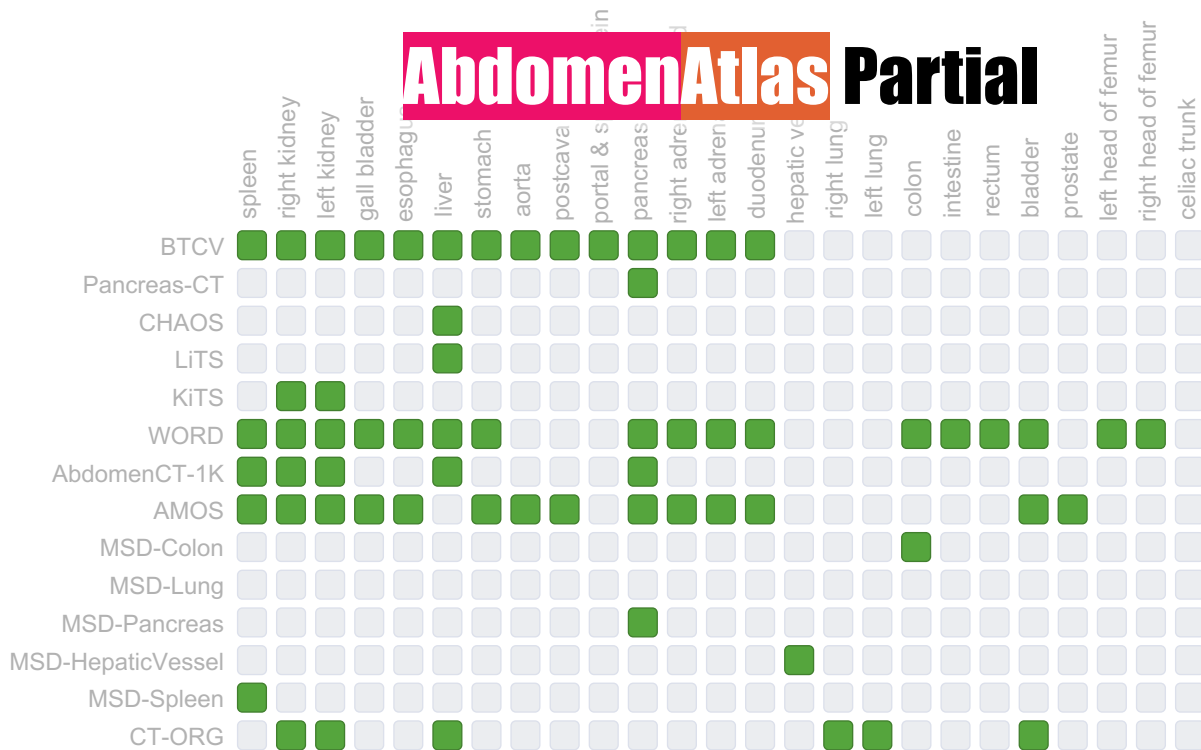


Example: an abdominal CT scan

AbdomenAtlas

CLIP-Driven
Universal Model

ICCV 2023
MICCAI 2023
RSNA 2023



■ unlabeled
■ labeled (public)

3,410 volumes

14 datasets

26 hospitals

8 countries

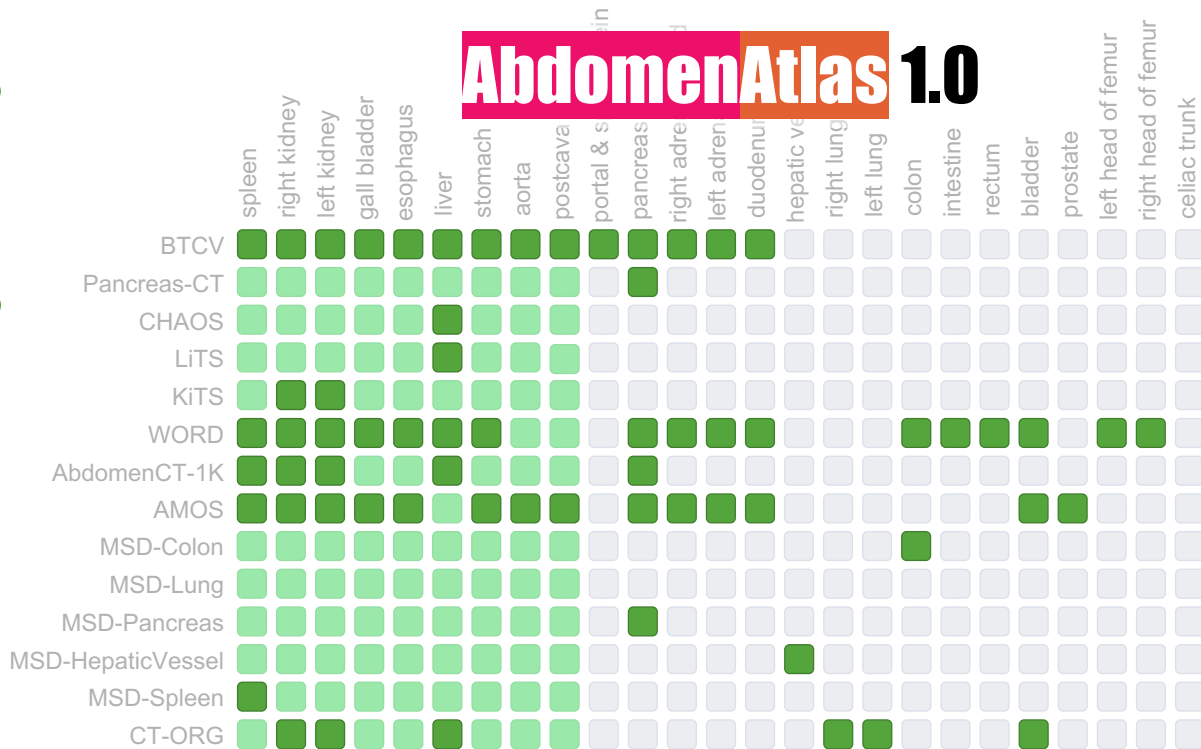
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RSNA 2023

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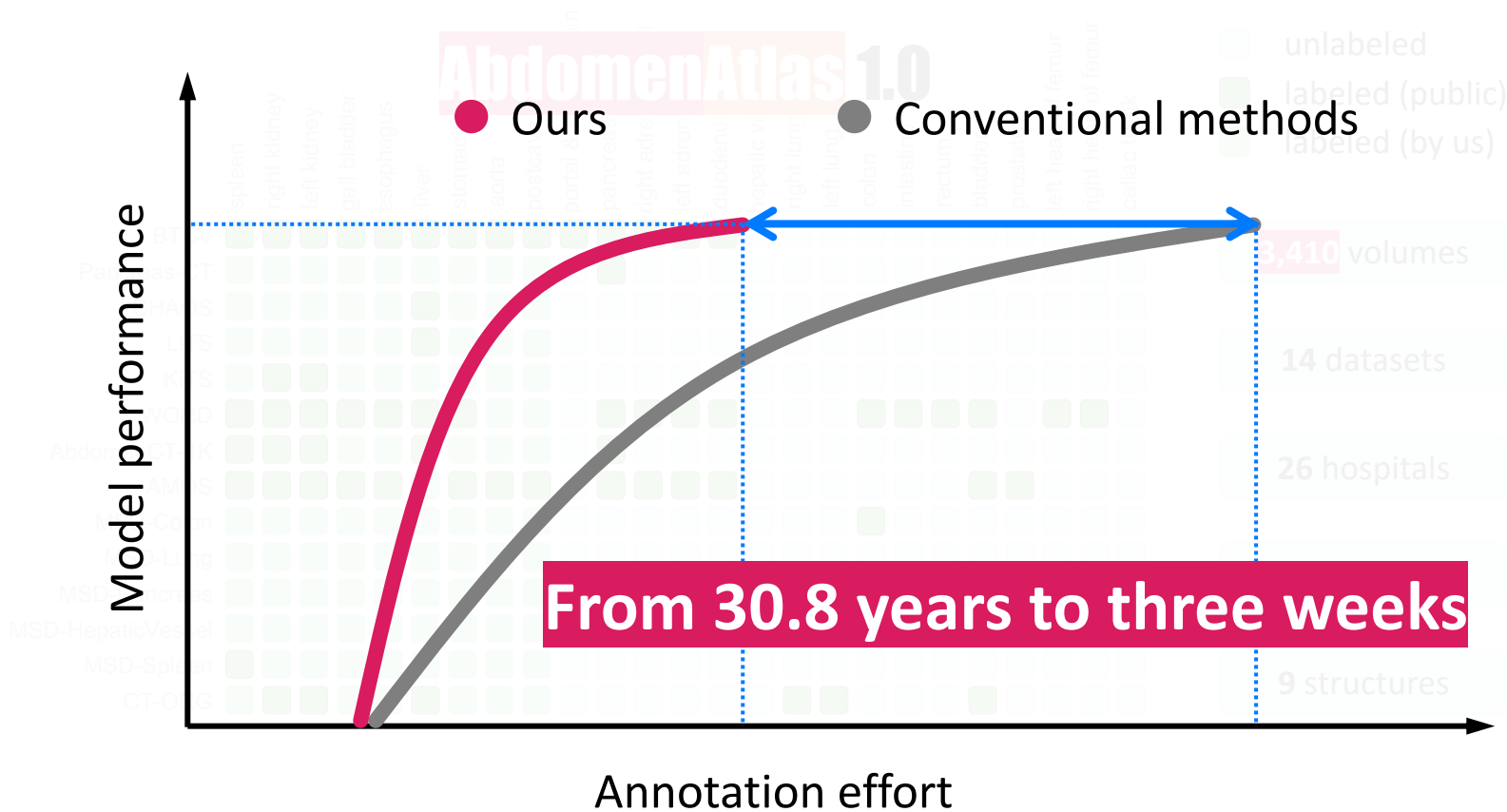
26 hospitals

8 countries

9 structures

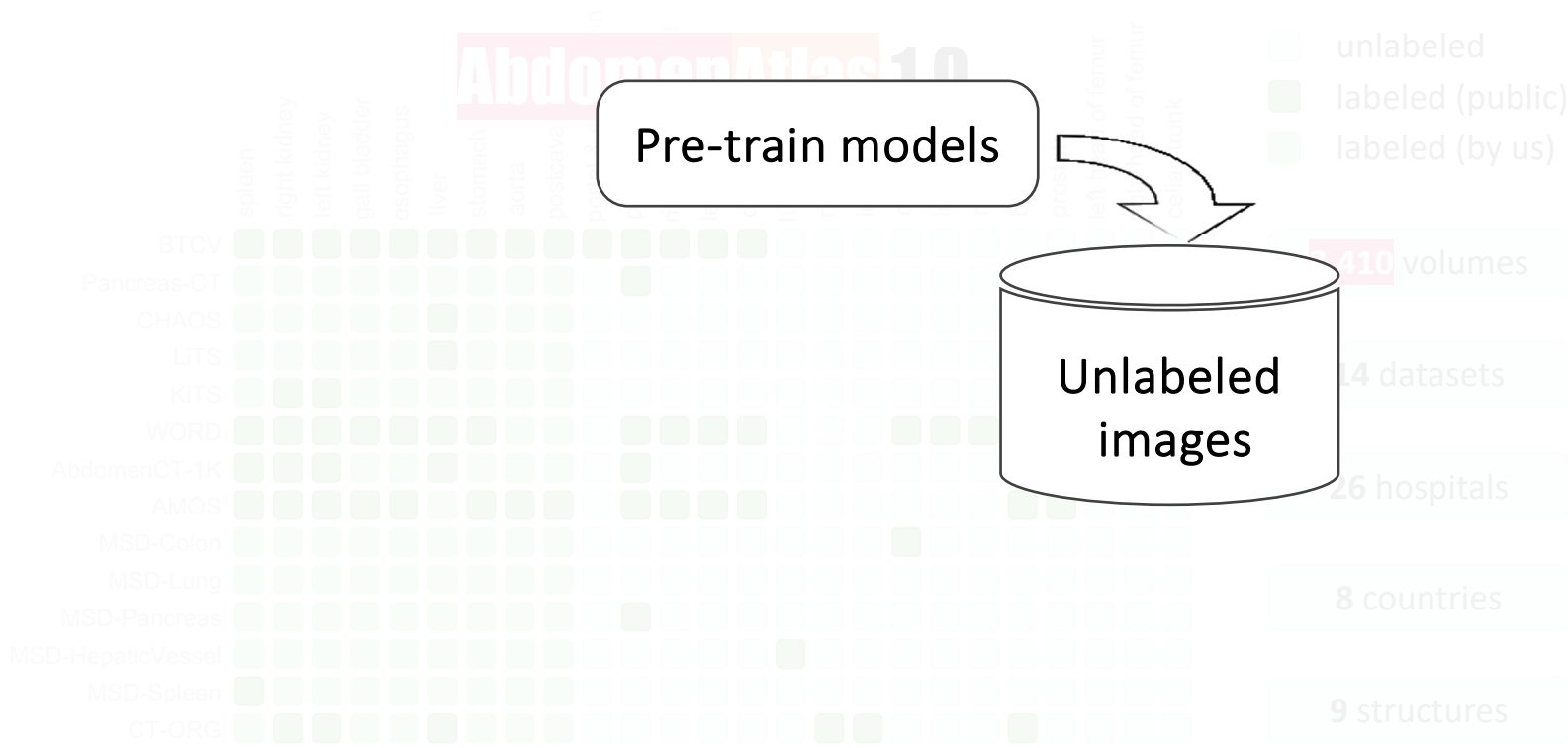
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**CLIP-Driven
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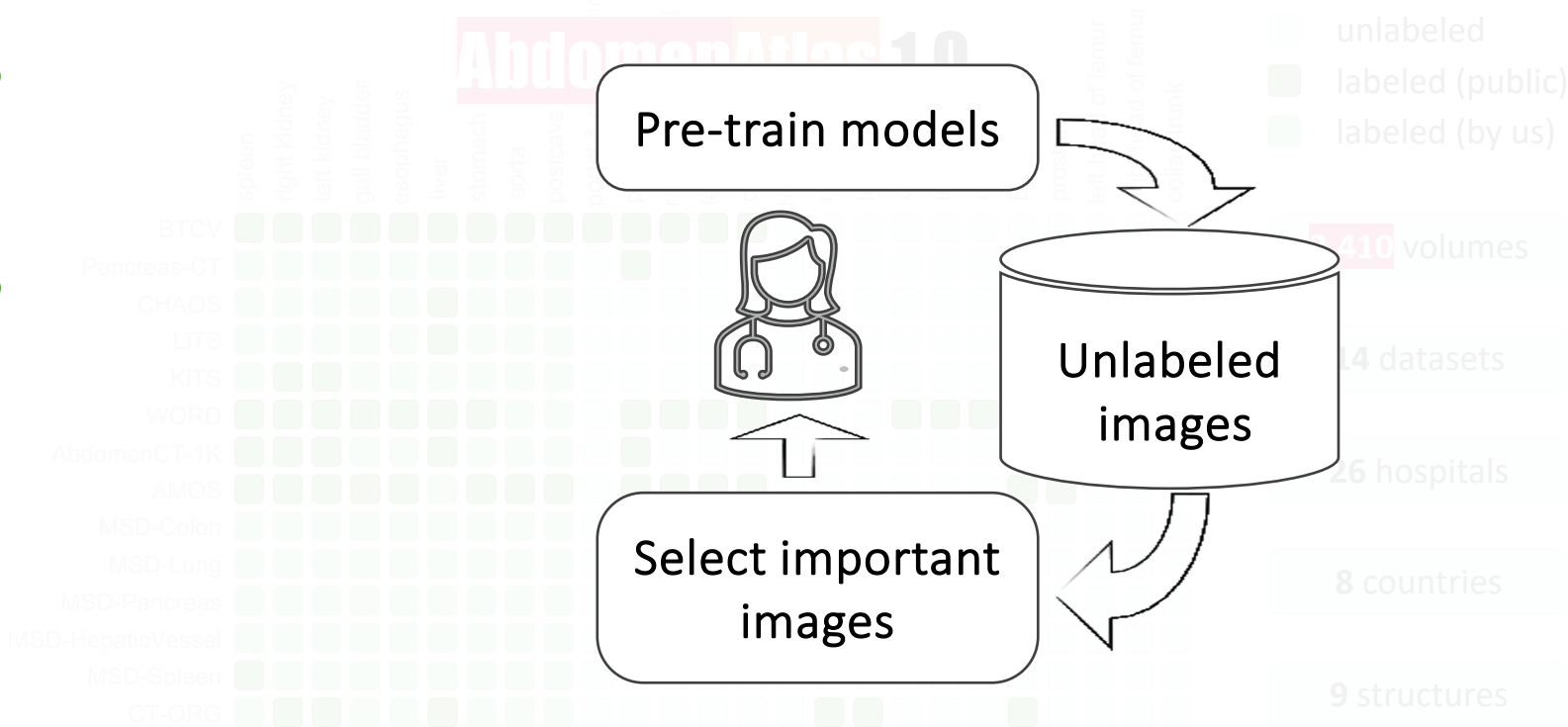
Interactive Segmentation



CLIP-Driven
Universal Model

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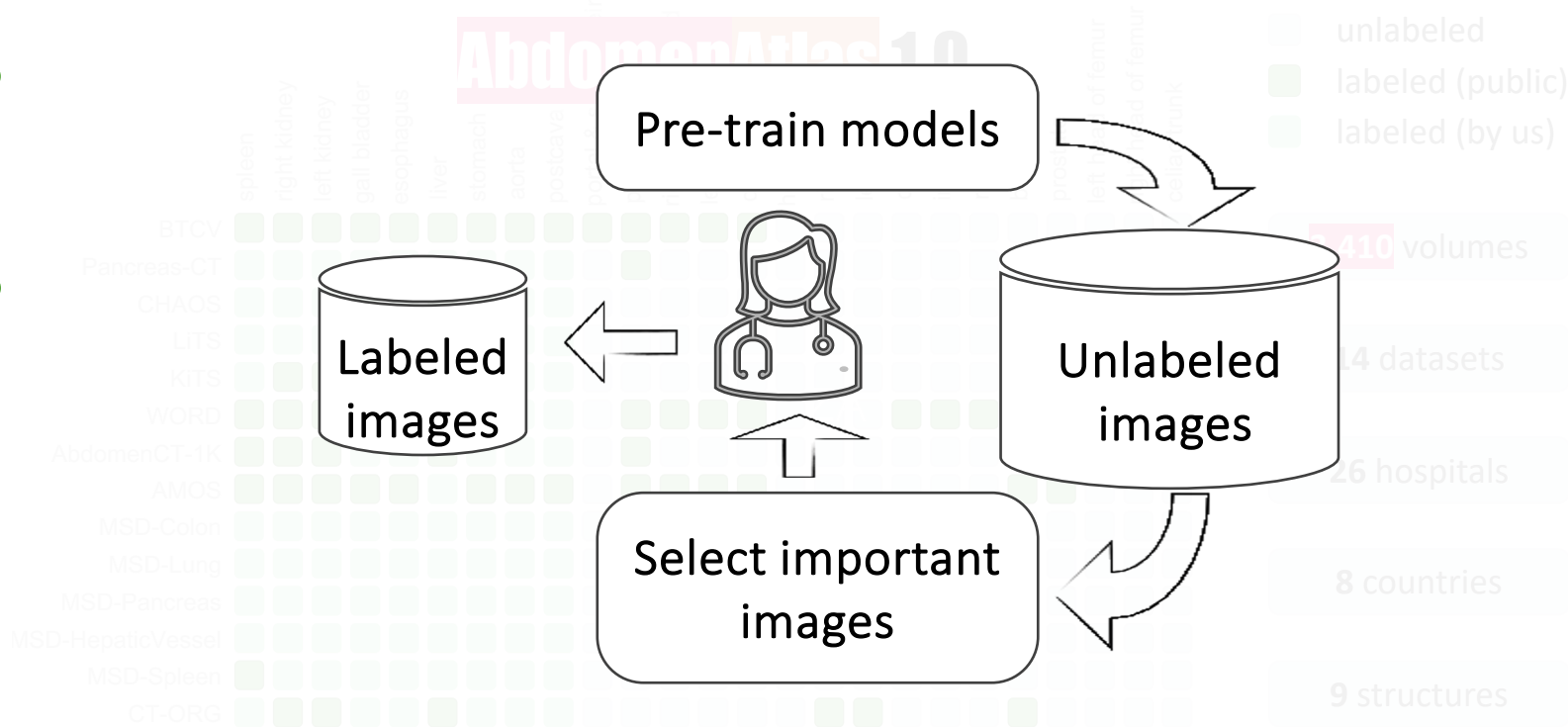
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Interactive Segmentation

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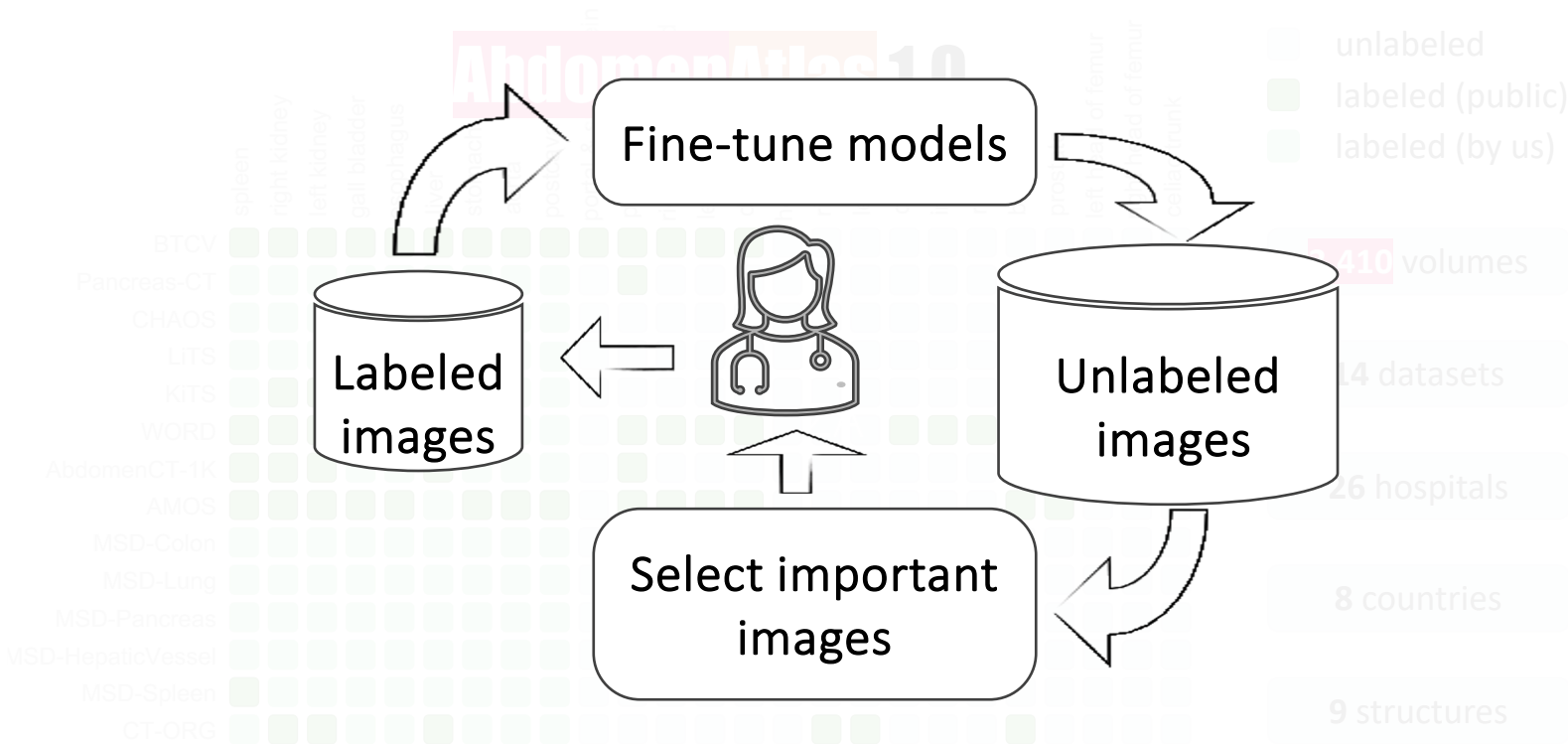


Interactive Segmentation

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Universal Model

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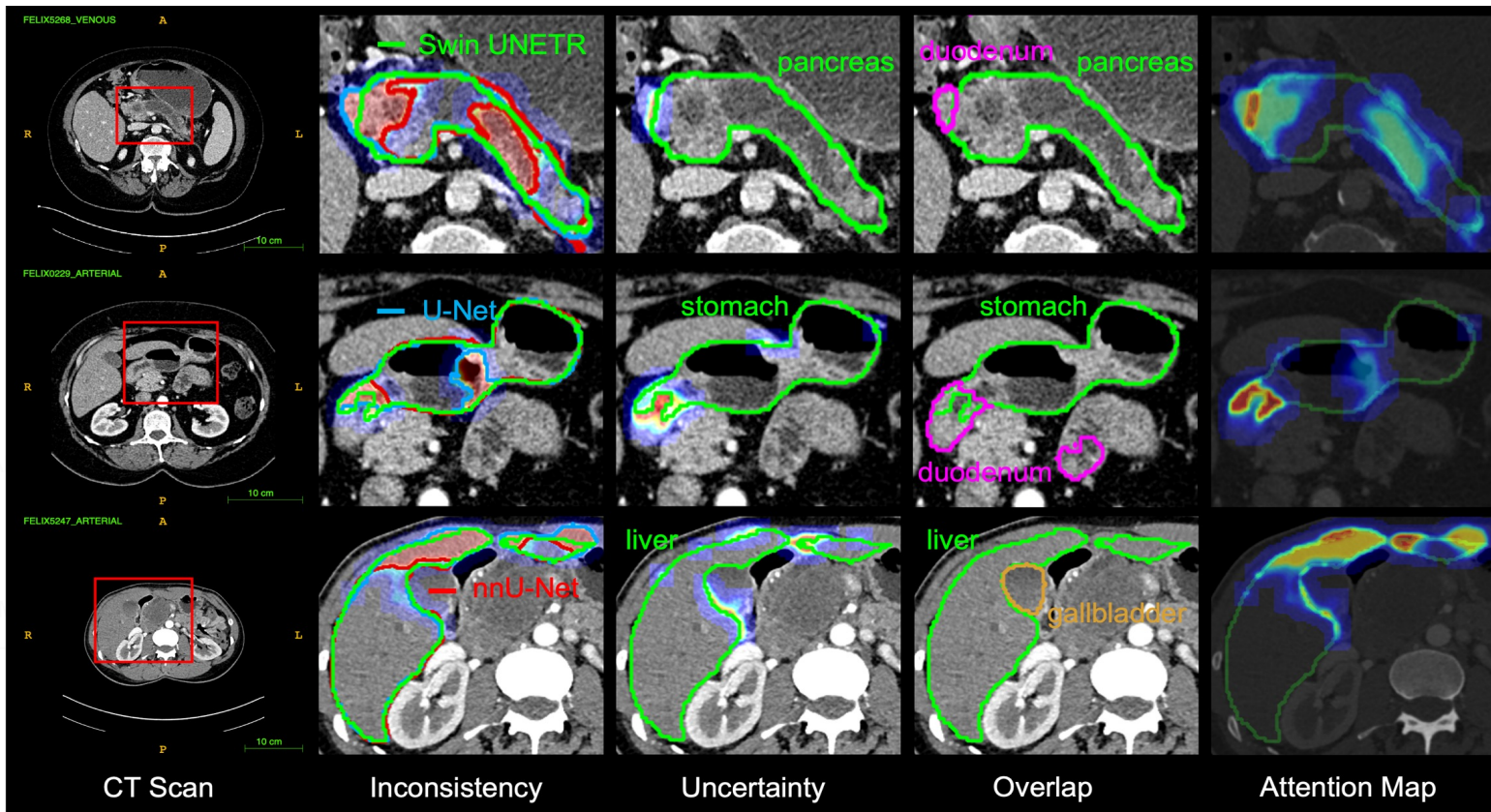
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Interactive Segmentation

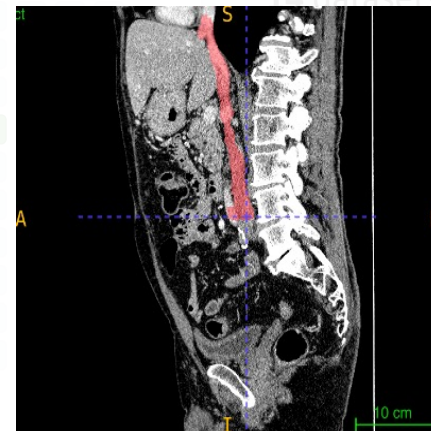
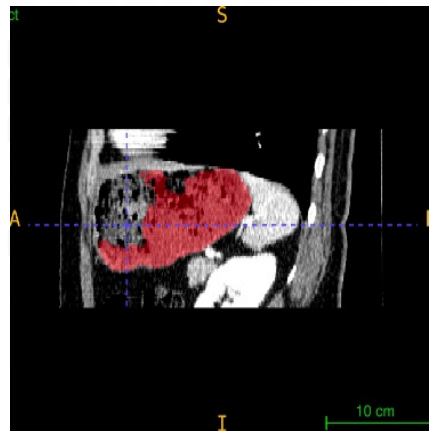
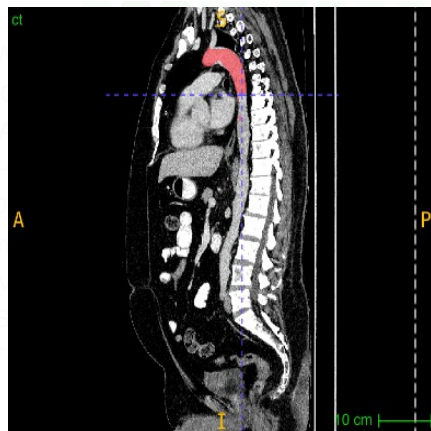
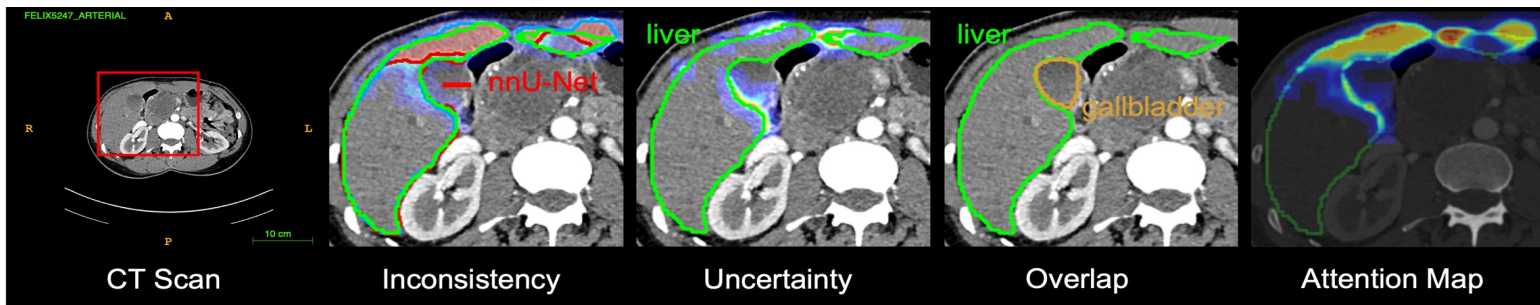
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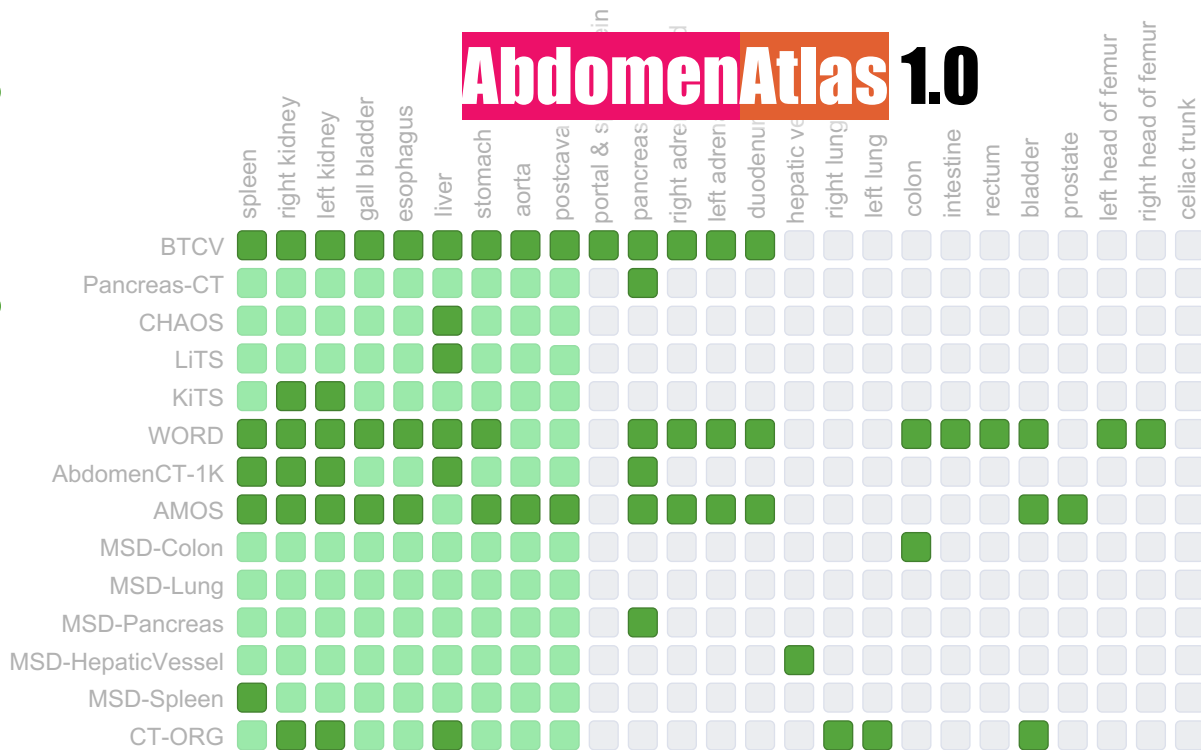


CLIP-Driven Universal Model

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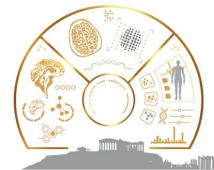
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9 structures



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@ISBI 2024 Challenge



IEEE INTERNATIONAL SYMPOSIUM
ON BIOMEDICAL IMAGING
ISBI 2024
27-30 MAY, 2024 – ATHENS, GREECE
MEGARON ATHENS INTERNATIONAL CONFERENCE CENTRE (MAICC)

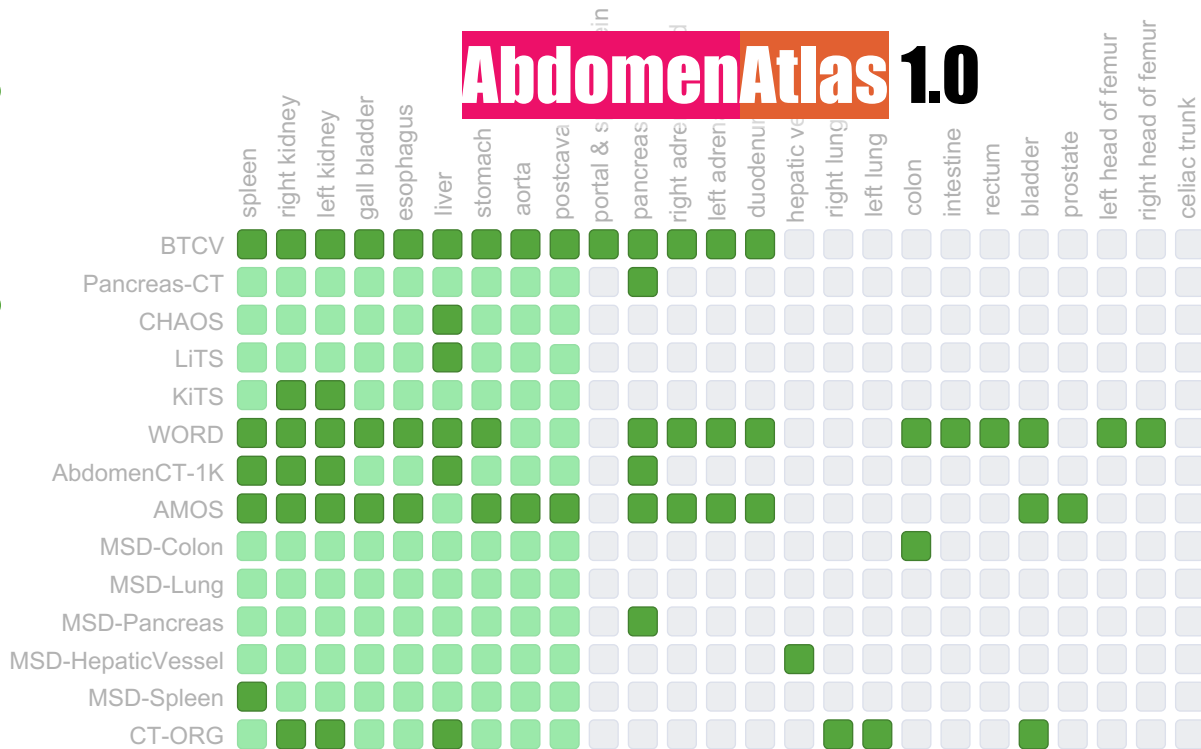
Backbone	Author	Institute	Publication	Backbone	Author	Institute	Publication
Swin-Unet	Hu Cao	Huawei	ECCVW	UniSeg	Yiwen Ye	NPU	MICCAI
nnFormer	Hong-Yu Zhou	HKU	TIP	SAT	Ziheng Zhao	SJTU	arXiv
CoTr	Yutong Xie	NPU	MICCAI	Swin UNETR	Ali Hatamizadeh	NVIDIA	MICCAIW
UniverSeg	Victor Ion Butoi	MIT	ICCV	VM-UNet	Jiacheng Ruan	SJTU	arXiv
UNet++	Zongwei Zhou	ASU	TMI	MagicNet	Duowen Chen	ECNU	CVPR
TransUNet	Jieneng Chen	JHU	ICMLW	MedSegDiff	Junde Wu	NUS	AAAI
U-Mamba	Jun Ma	UToronto	arXiv	3D UNeXt	Jeya Maria Jose	JHU	MICCAI
DiNTS	Yufan He	JHU	CVPR			

So far, **31 groups** have confirmed the contribution—we will invite more authors of **famous backbones** for medical segmentation.



CLIP-Driven
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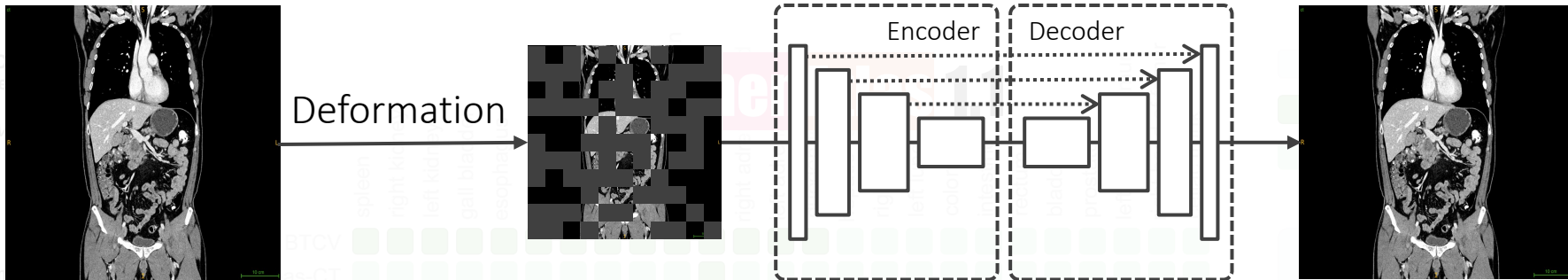
3,410 volumes

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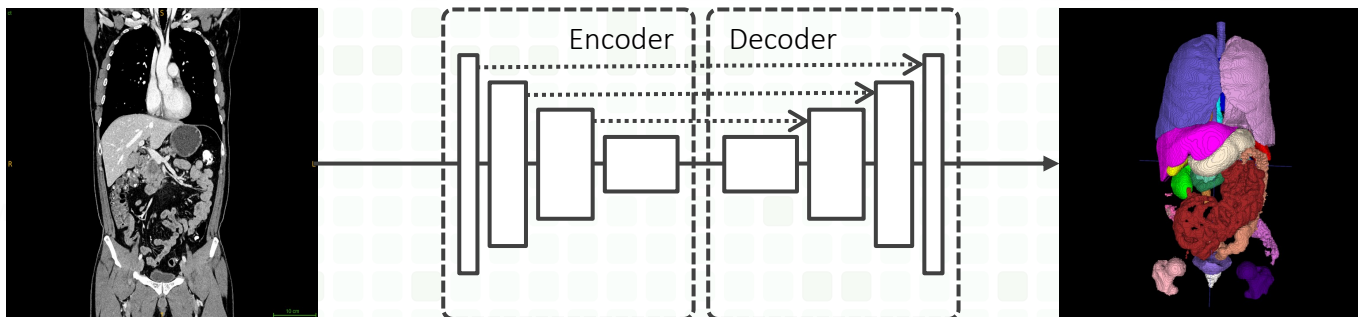
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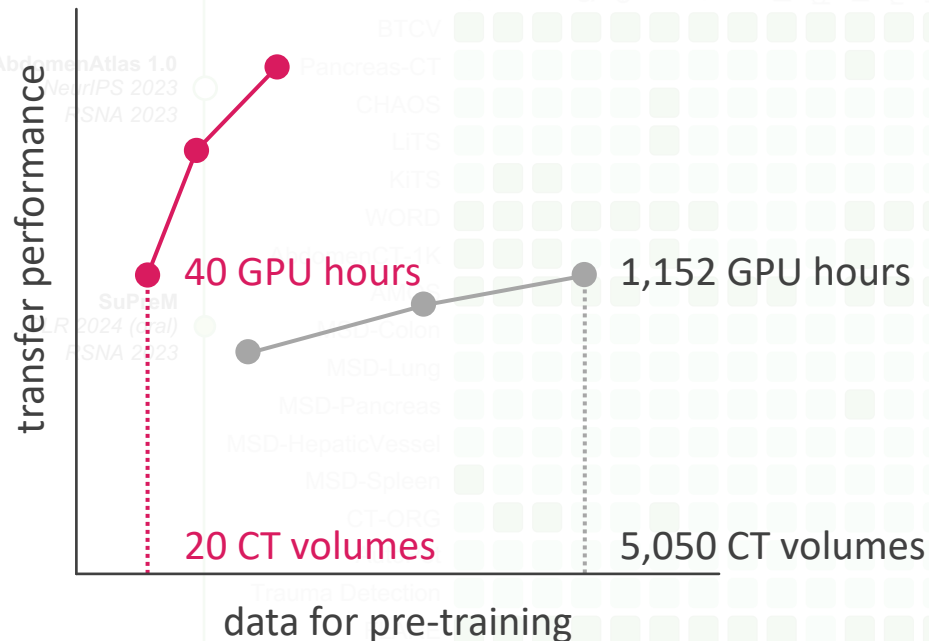


Self-supervised Pre-training

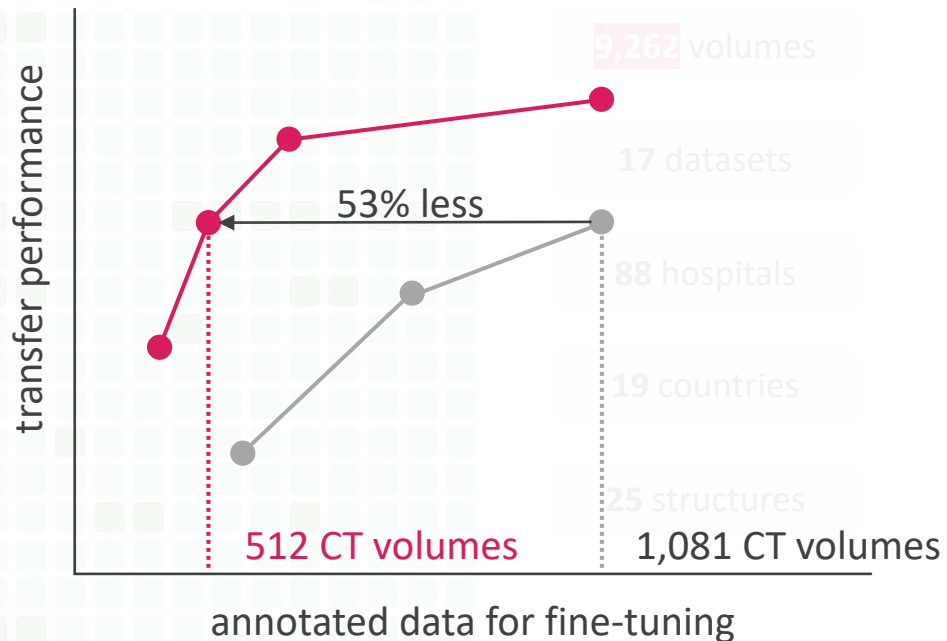


Supervised Pre-training




Supervised > Self-supervised data & computation efficiency








Supervised > Self-supervised annotation & learning efficiency



▼ Swin UNETR

name	params	pre-trained data	resources	download
Tang et al.	62.19M	5050 CT	 Stars 850	weights
Jose Valanaras et al.	62.19M	50000 CT/MRI	 Stars 850	weights
Universal Model	62.19M	2100 CT	 Stars 371	weights
SuPreM	62.19M	2100 CT	ours 🌟	weights

▼ U-Net

name	params	pre-trained data	resources	download
Models Genesis	19.08M	623 CT	 Stars 693	weights
UniMiSS	tiny	5022 CT&MRI	 Stars 39	weights
	small			weights
Med3D	85.75M	1638 CT	 Stars 1.7k	weights
DoDNet	17.29M	920 CT	 Stars 151	weights
Universal Model	19.08M	2100 CT	 Stars 371	weights

▼ SegResNet

name	params	pre-trained data	resources	download
SuPreM	62.19M	2100 CT	ours 🌟	weights





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@MICCAI 2024 Challenge



17 datasets

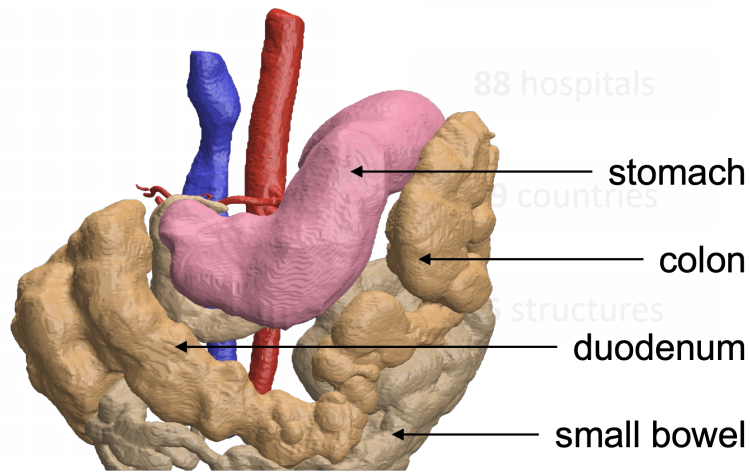
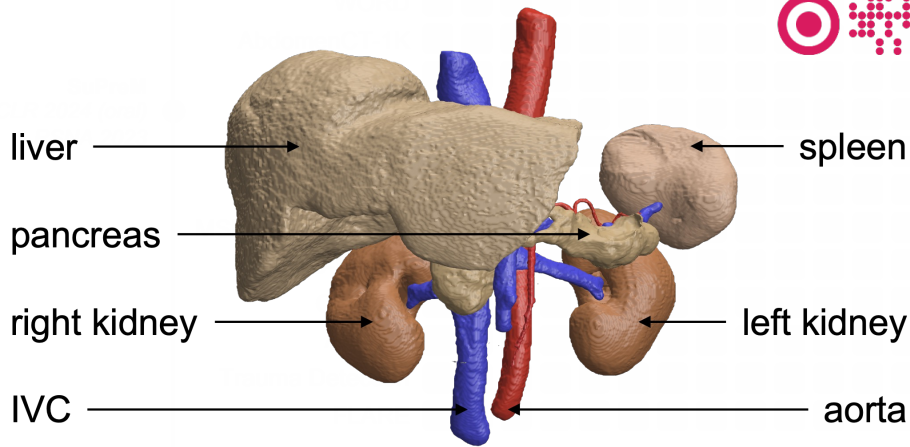
88 hospitals

stomach

colon

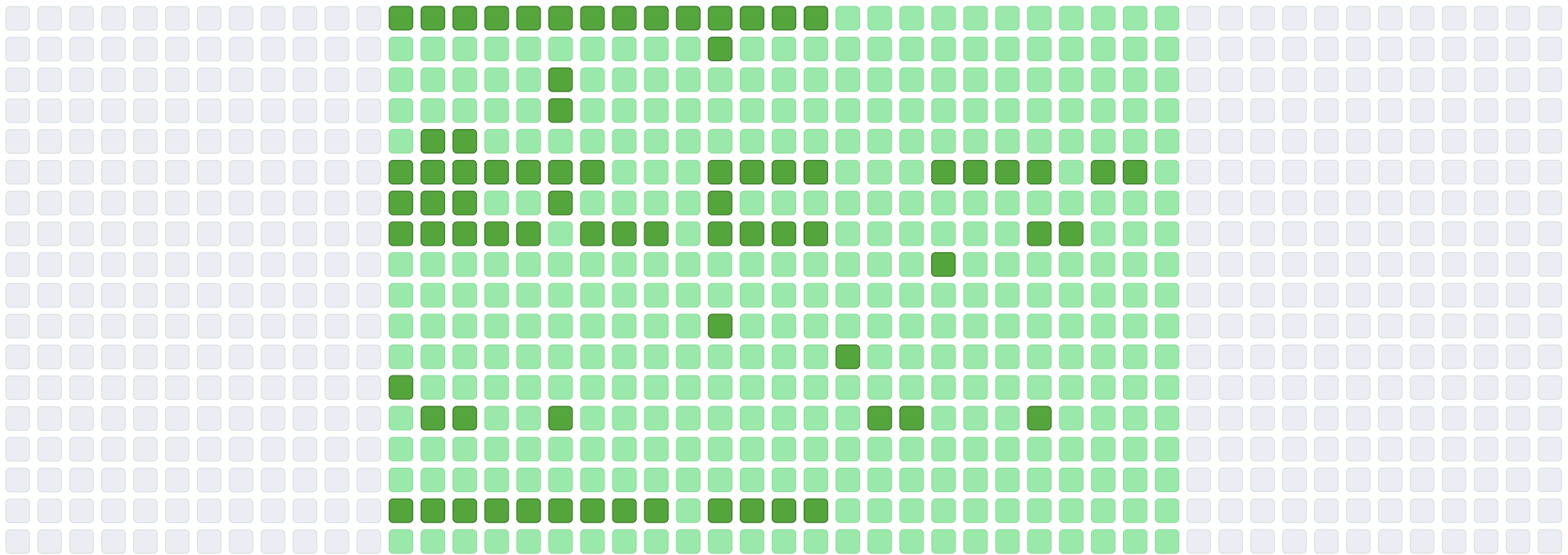
duodenum

small bowel



AbdomenAtlas

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AI and Radiologists Unite to Map the Abdomen

Hopkins researchers have leveraged the synergy between medical professionals and artificial intelligence algorithms to create the largest annotated multi-organ dataset to date.

PUBLISHED
February 9, 2024

AUTHOR
Jaimie Patterson

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Wenxuan Li
wli131@jh.edu

Code, Dataset, & Model:
<https://github.com/MrGiovanni/SuPreM>

Annotated

1.2M

CT slices

Annotated

3,410

CT volumes

Annotated

9

body structures

AbdomenAtlas 1.0

release date: 02/09/2024 Happy Chinese New Year

PUBLISHED
February 9, 2024

AUTHOR
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Annotated

3.5M

CT slices

Annotated

9,262

CT volumes

Annotated

25

body structures

AbdomenAtlas 1.1

release date: 12/25/2024 Merry Christmas

PUBLISHED
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AUTHOR
Jaimie Patterson

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APPLY REQUEST INFORMATION GIVE

Annotated

8.5M

CT slices

Annotated

22,682

CT volumes

Annotated

142

body structures

AbdomenAtlas Pro

internal use only open for collaboration

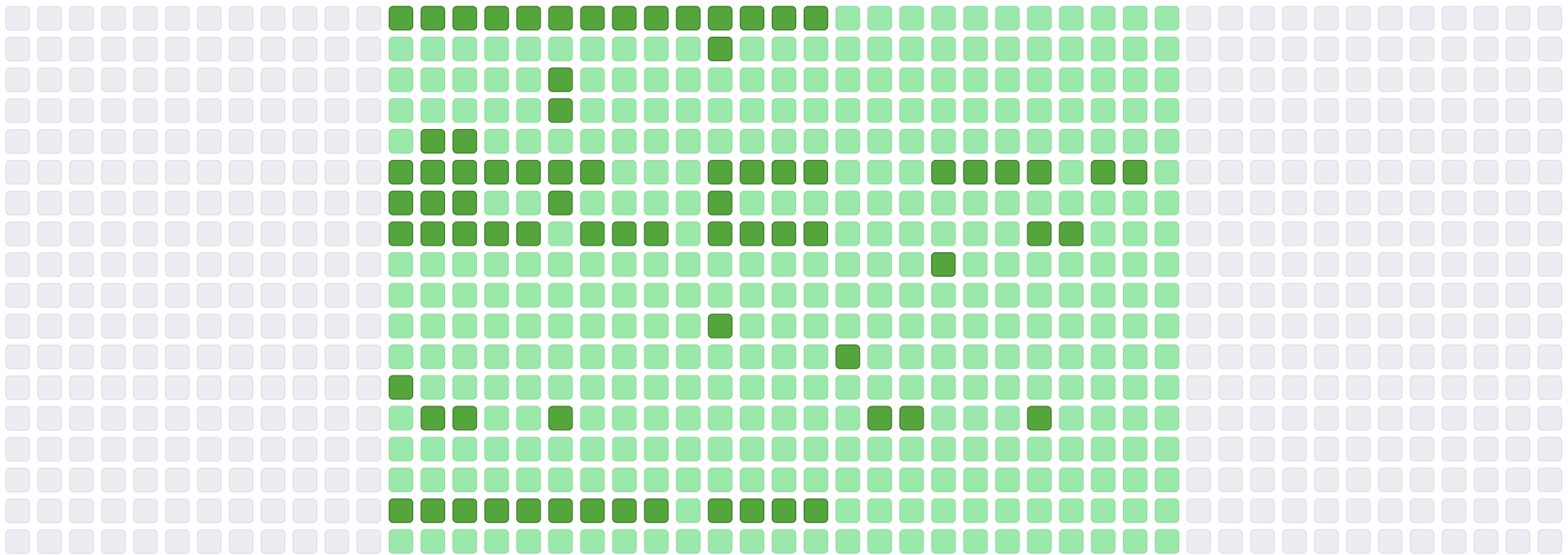
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Thank you!

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