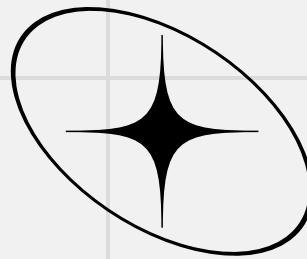


WINTER 2024



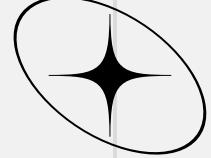
AIM FALL 2024 PROJECT PRESENTATION

MEDVISOR

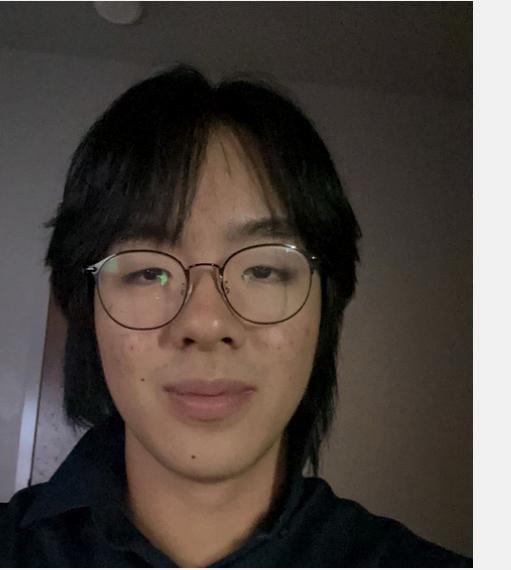
AI MRI ANALYSIS

LOVE BHUSAL, TU DAO, ELDEN DEGUA, RILEY MCKINNEY,
SAI PERAM, RISHIL UPPALURU

OUR TEAM



LOVE BHUSAL
(MENTOR)



TU DAO



ELDEN DEGUA



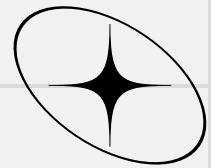
RILEY MCKINNEY



SAI PERAM



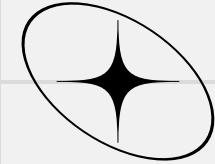
RISHIL UPPALURU



THE PROBLEM:

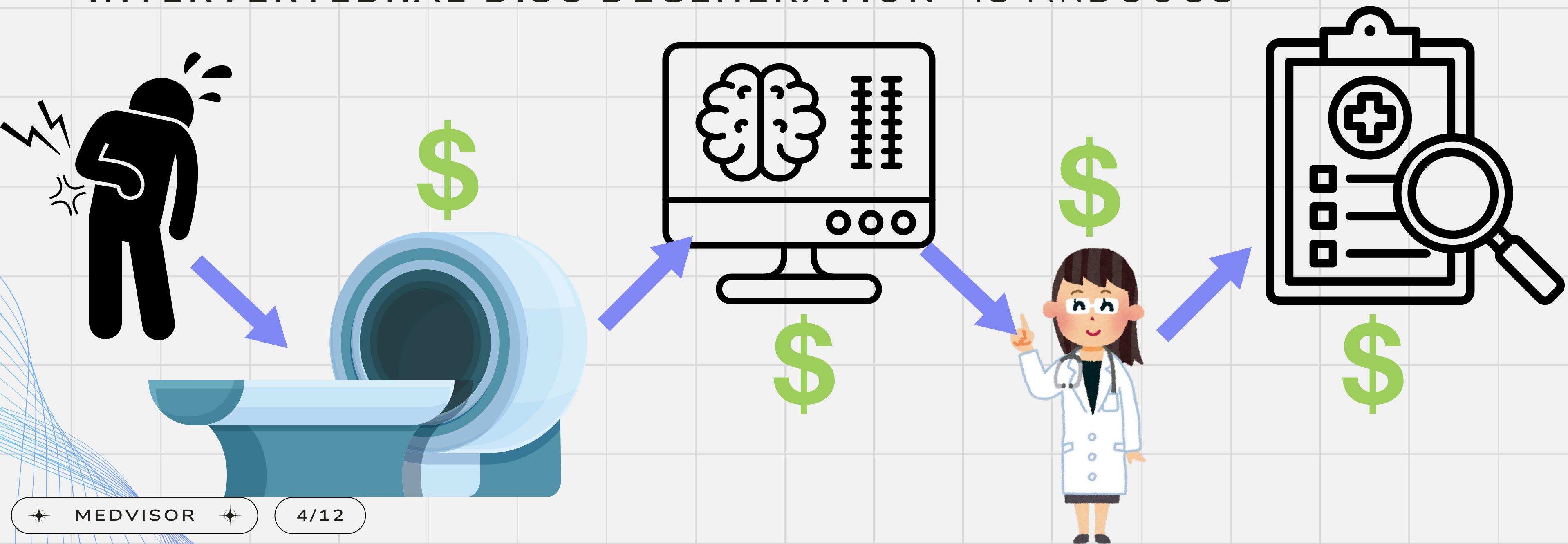
TOO MANY BARRIERS TO
SIMPLE DIAGNOSIS

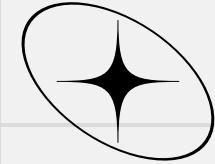




THE PROBLEM:

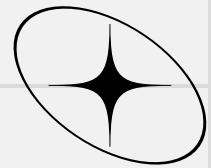
THE PATH FROM “MY BACK HURTS” TO “DIAGNOSED WITH INTERVERTEBRAL DISC DEGENERATION” IS ARDUOUS





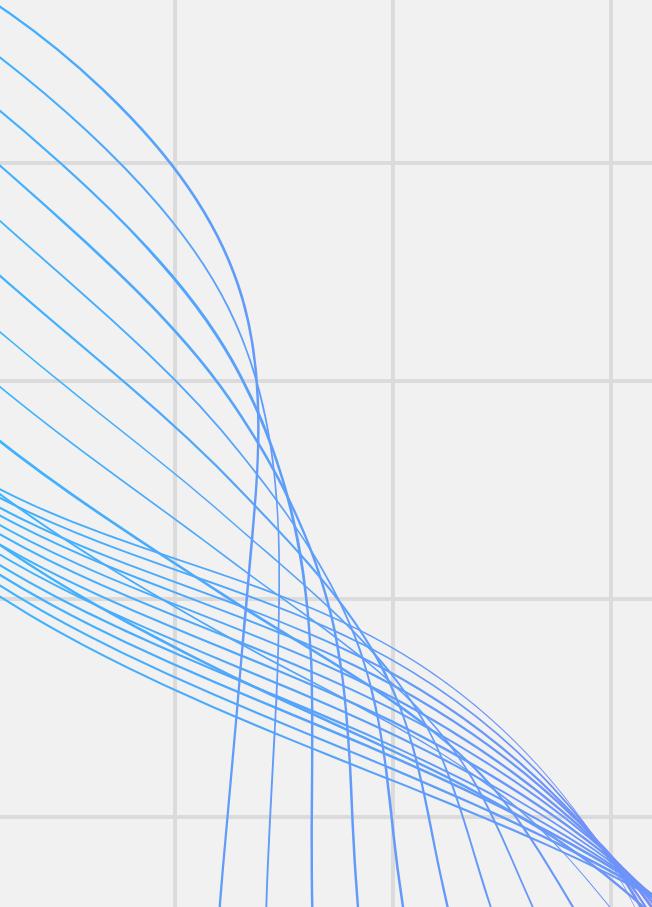
BACKGROUND:

- SPINAL ASSESSMENT IS DONE PER VERTEBRAE
- SPINAL GRADING SYSTEMS: PFIRRMAN / MODIC
- SPINAL ABNORMALITIES: HERNIATION, NARROWING, BULGING...



SOLUTION:

THE TWO MODEL SYSTEM



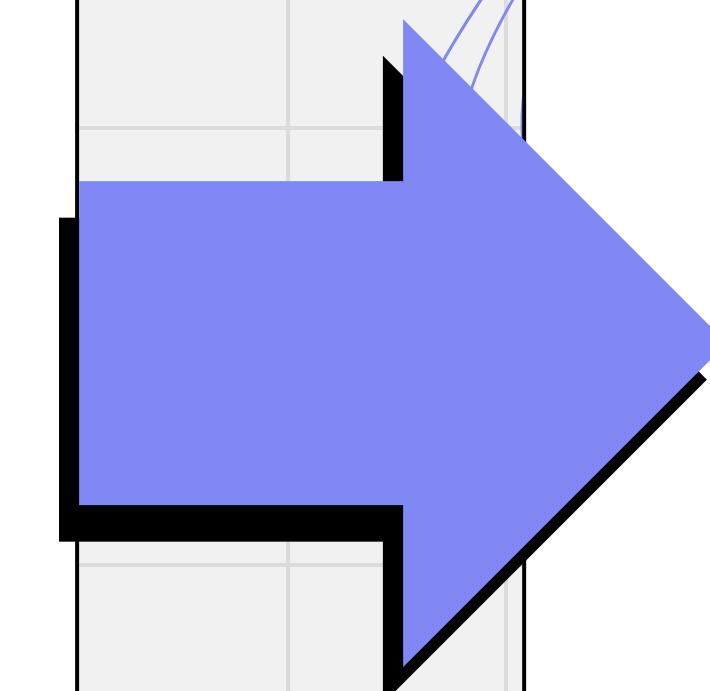
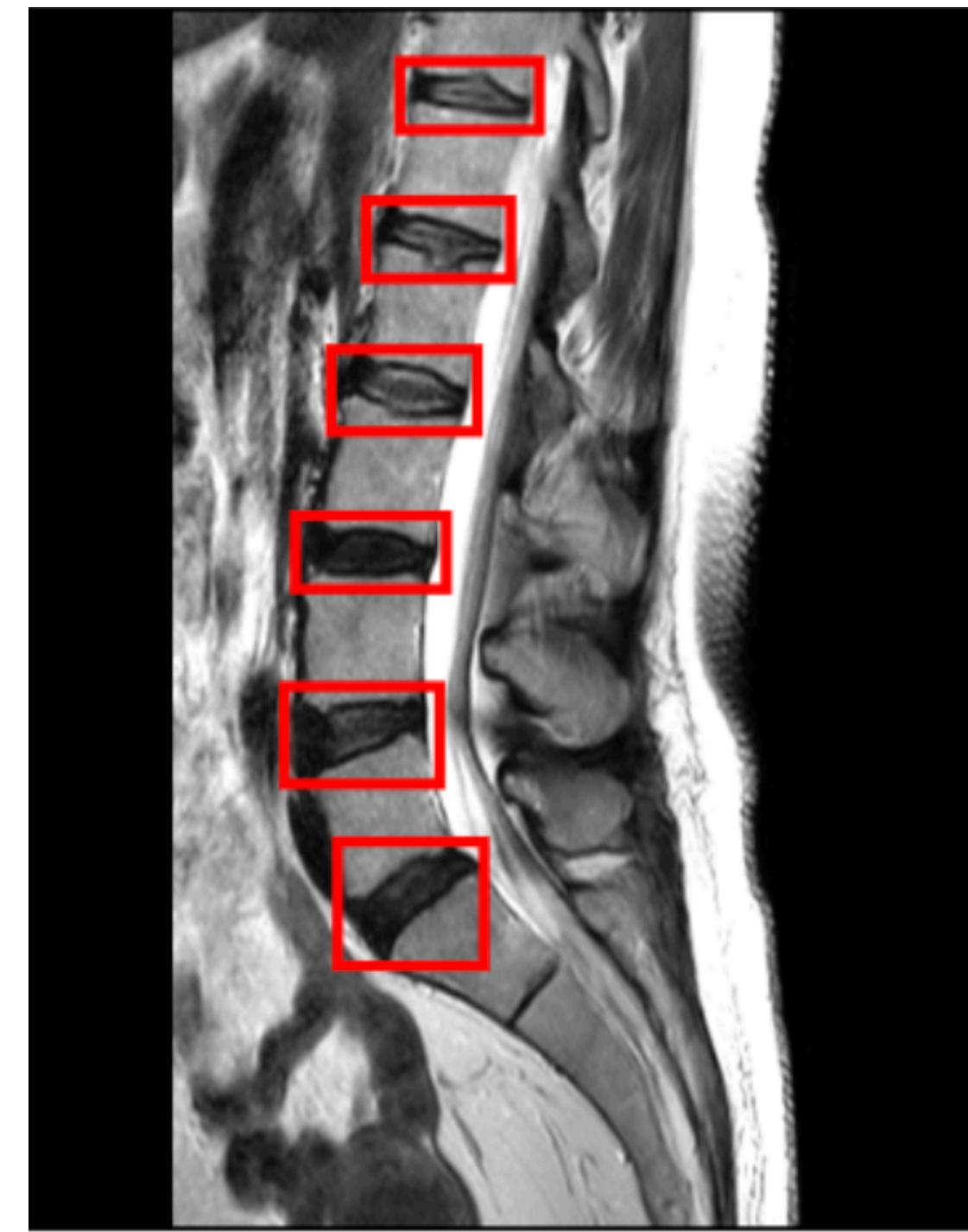
MODEL 1: SEGMENTATION

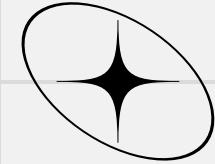
FULL SPINE MRI → INDIVIDUAL VERTEBRAE

INITIAL INPUT MRI SCAN



IDENTIFIED DISCS

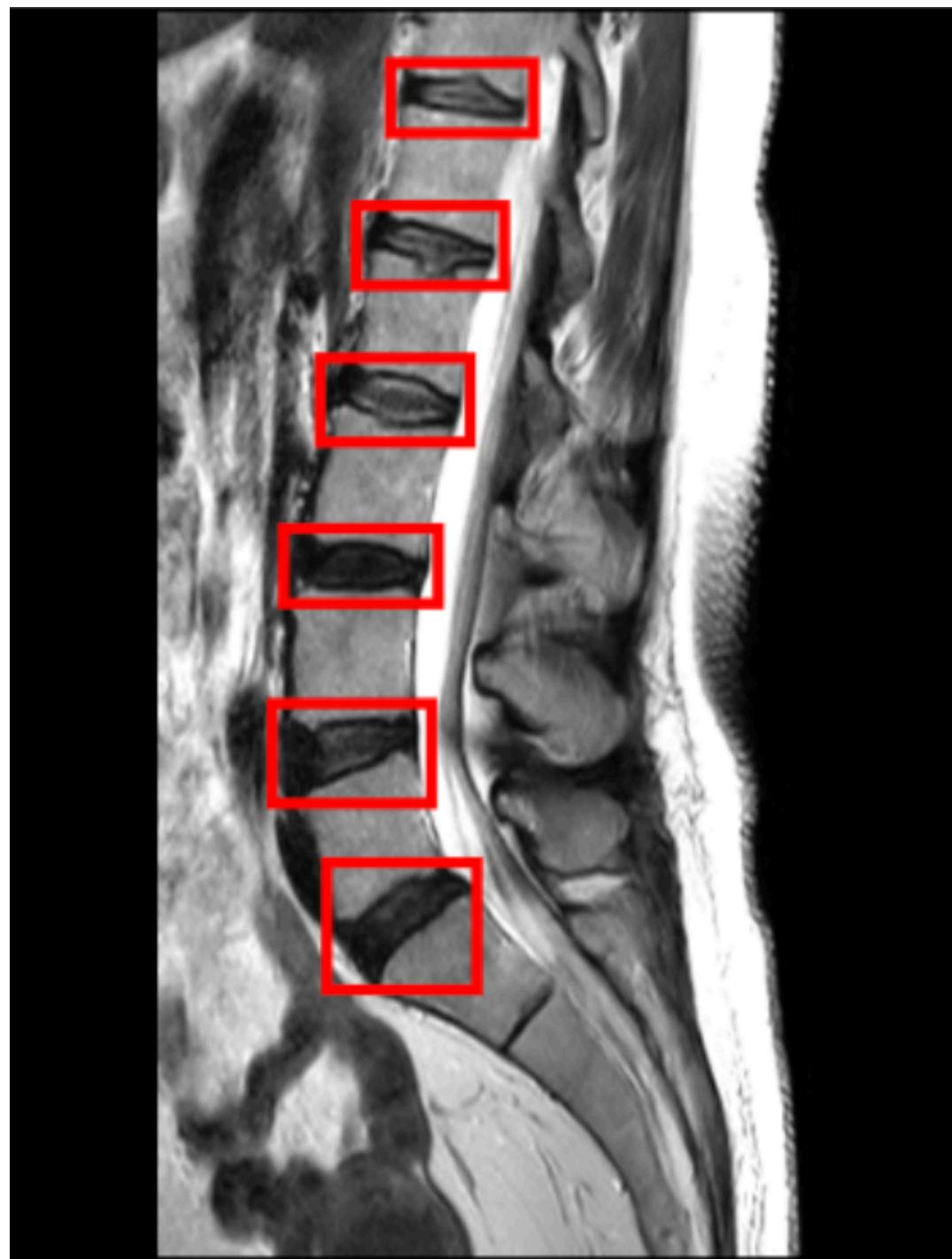




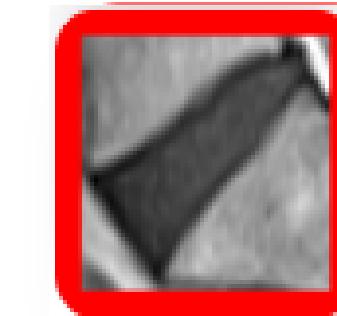
MODEL 2: CLASSIFICATION

INDIVIDUAL VERTEBRAE → DISK DEVIATION CLASSIFICATION

BOXED IMAGE INPUT



CLASSIFIED VERTEBRAE



Pfirrman Grade: 2

Modic: 0

Up Endplate: 0.89

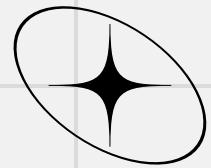
Low Endplate: 0.78

Disc Herniation: 0.03

Disc Narrowing: 0.44

Disc Bulging: 0.91

Spondylolisthesis: 0.00



DUAL MODEL TECH STACK

OPENCV



TENSORFLOW



PYTHON



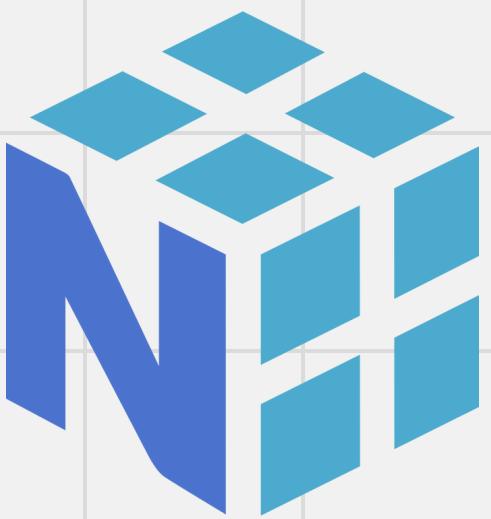
PYTORCH



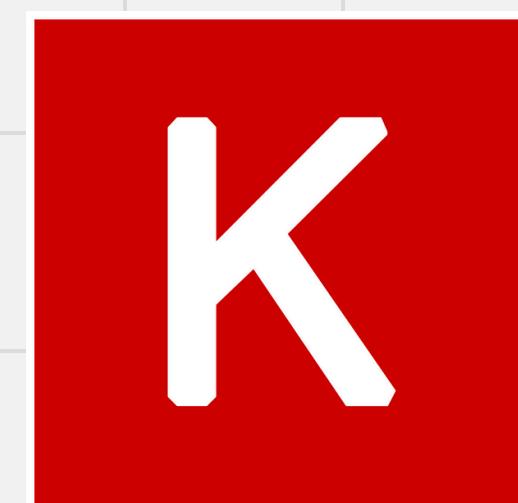
SIMPLEITK



NUMPY

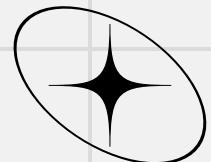


KERAS



MATPLOTLIB





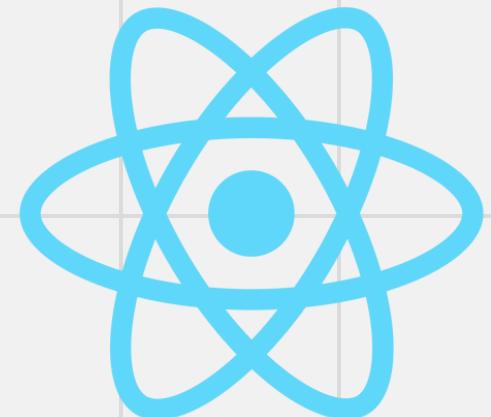
APPLICATION TECH STACK

FRONTEND:

CHAKRA UI



REACT



BACKEND:

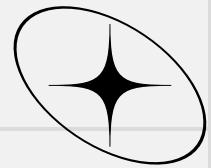
PYTHON



FLASK



DEMO



React App back pain mri - Google Search

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MedicalNewsToday Lumbar MRI Scan: How to read it, how ...

MRI Results and Low Back Pain 30% of 20 year olds have disc herniations and no pain

Infinite Potential Physio... MRI and Low Back Pai...

South Jersey Radiology Scan For Diagnosing Back Pain

Holland Park Osteopathic Practice an MRI for Your Back Pain ...

Next Step Health Back pain: Don't let the MRI scare ...

Ace Sports Clinic Diagnostic Imaging fo...

Holland Park Osteopathic Practice an MRI for Your Back Pain ...

Caring Medical CT Scan sending yo...

Touchstone Medical Imaging MRI for Back Pain—See What's Inside ...

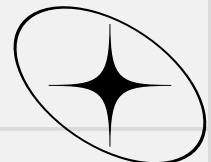
Washington University Orthopedics Understanding Low Back Pain

MRiguidance BoneMRI now available for lower back...

MRI scan BoneMRI CT scan

MRI SCAN OF LUMBAR SPINE

<https://www.google.com/imgres?q=back+pain+mri&imgurl=https%3A%2F%2Fsa1s3optim.pat...>



MOVING FORWARD

- TRAIN MODELS ON WIDER RANGE OF SPINAL IMAGING
- EXPAND SCOPE OF MRI ANALYSIS
- BRIDGE TO NON-PROFESSIONAL USER BASE
- PREDICTIVE PROGRESSION OF SYMPTOMS

