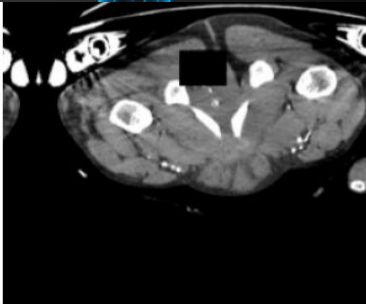


Detecting Abdominal Trauma

By: Eric Wolf





Introduction

- Traumatic injuries as a global health threat
- Over 5 million annual deaths worldwide
- Timely and accurate diagnosis
- CT scans typically utilized for diagnosis

Challenges in Abdominal Trauma Diagnosis

- Interpreting CT scans for abdominal trauma is complex
- Especially challenging in cases of multiple injuries or subtle bleeding





RSNA Abdominal Trauma Detection

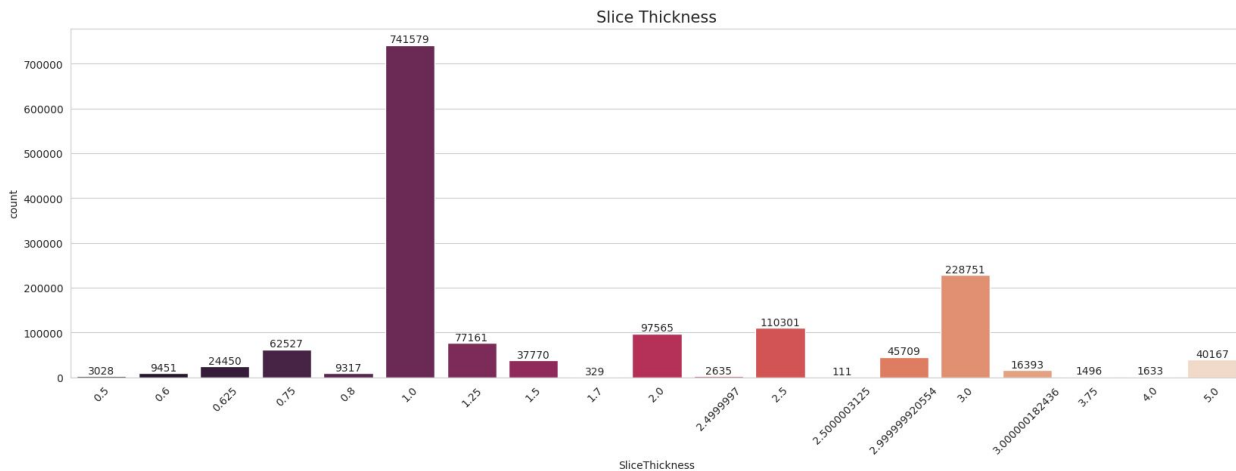
- Collaboration with ASER and SAR
- Focus on detecting severe injuries to internal abdominal organs
- Liver, kidneys, spleen, bowel, and identification of internal bleeding



Data Source and Wrangling

- Data sourced from 23 research institutions across 14 countries
- Dataset includes de-identified abdominal CT studies and clinical information
- Key findings from data wrangling and exploratory data analysis

Slice Thickness Distribution





Data Modeling

- Meticulous data cleaning and preprocessing
- Conversion of the dataset into PNG images from DICOM
- Selection of four distinct models: Baseline, ResNet-50, EfficientNet B7, and Xception



Model Details

- Baseline model: Established for comparison
- ResNet-50: Depth and capacity for intricate feature capture
- EfficientNet B7: Tailored design for high computational capacity
- Xception: Innovative architecture with depthwise separable convolutions



Results Summary

Model	Best Loss	Accuracy	Recall	Precision
Base	3.159	75.5%	73.9%	76.2%
Resnet 50	0.753	100.0%	100.0%	100.0%
EfficientNet B7	1.05	97.8%	97.7%	97.9%
Xception	1.336	94.8%	94.5%	95.0%



Final Model Selection

- ResNet-50 recommended due to consistent dominance across metrics



Future Improvements

- Multifaceted approach for refining AI in abdominal trauma detection
- Iterative refinement of existing models
- Exploration of ensemble methods
- Commitment to collaboration with the medical community
- Incorporation of interpretability tools into models
- Addressing emerging challenges and staying abreast of advancements



Questions?