Delayed Phase Scan Prediction for Multiphase Liver CT Dose Reduction (310176)

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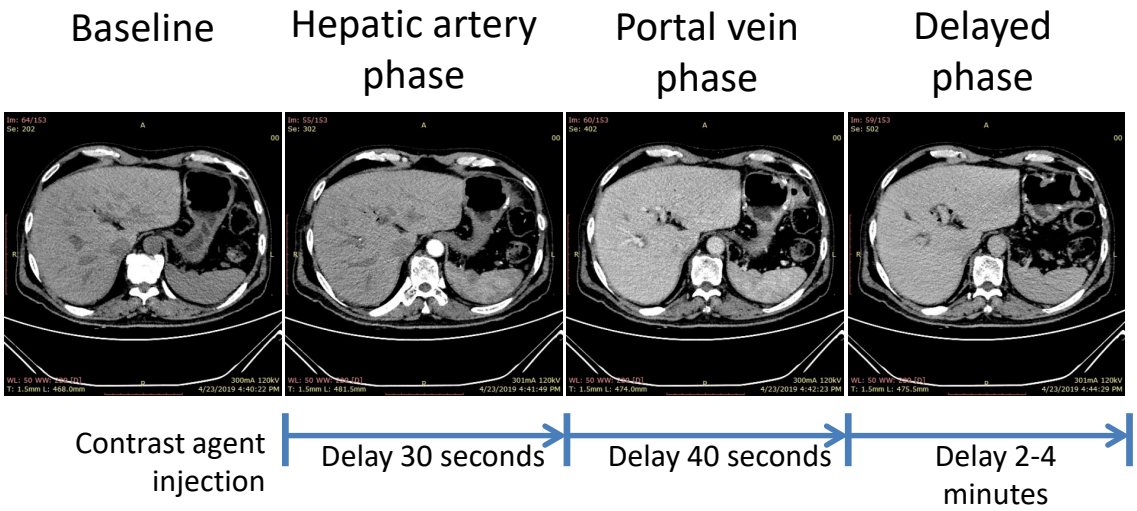
Background

- A normal multiphase CT usually consists of four CT scans, one scan without contrast agent as the baseline and three scans at different times with intravenous-injected contrast agents.

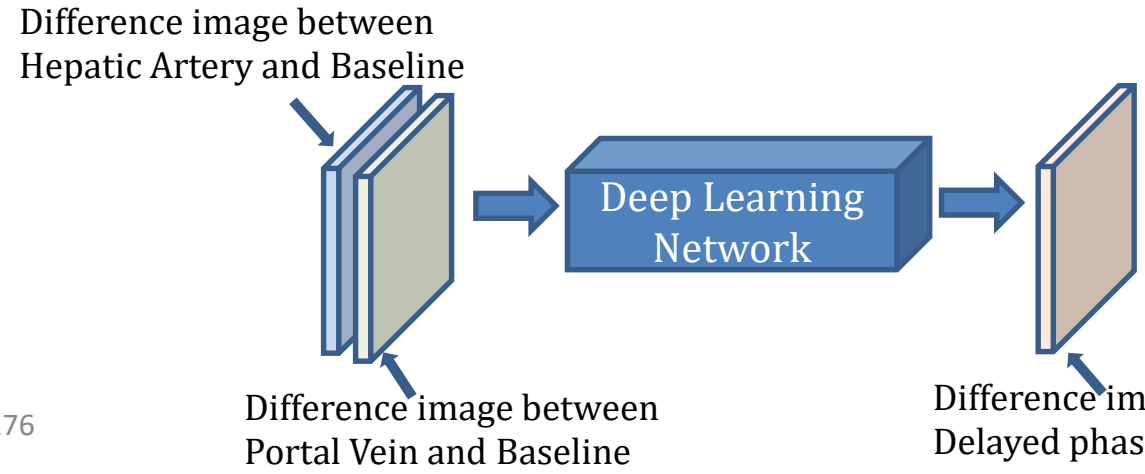


Goals

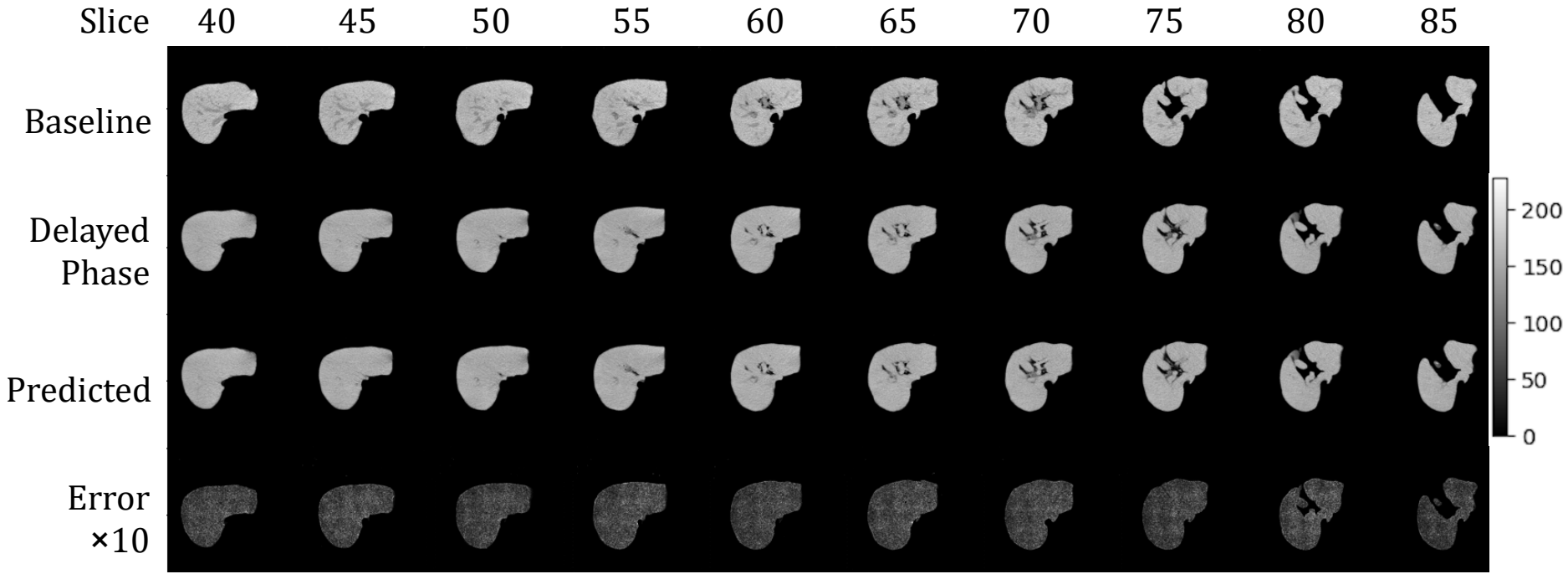
- The objective of this study is to derive the delayed phase scan in the multiphase CT protocol from the other three scans using machine learning, which will reduce 25% radiation dose.

Methods

- Intra-subject 3D volume registration and liver segmentation
- Deep Learning: Modified U-Net architecture
- Input the difference between Hepatic Artery, Portal Vein phases and Baseline
- Predict the difference between Delayed phase and Baseline



Results



Error is the absolute difference between the ground truth and predicted images.

Conclusions

- The delayed phase images can be derived from the baseline, hepatic artery and portal vein phases in high accuracy.
- The dose in multiphase CT scans will be reduced 25% without the delayed phase scan.

References

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