Supplementary text for -

Unsupervised Landmark Detection and Classification of Lung Infection Using Transporter Neural Networks

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January 2022

Code and Data Availability

In order to enable the reproducability of the proposed keypoint detection, the relevant inference scripts are made available freely at our official repository: https://github.com/tripathiarpan20/US-Transporter-eval.

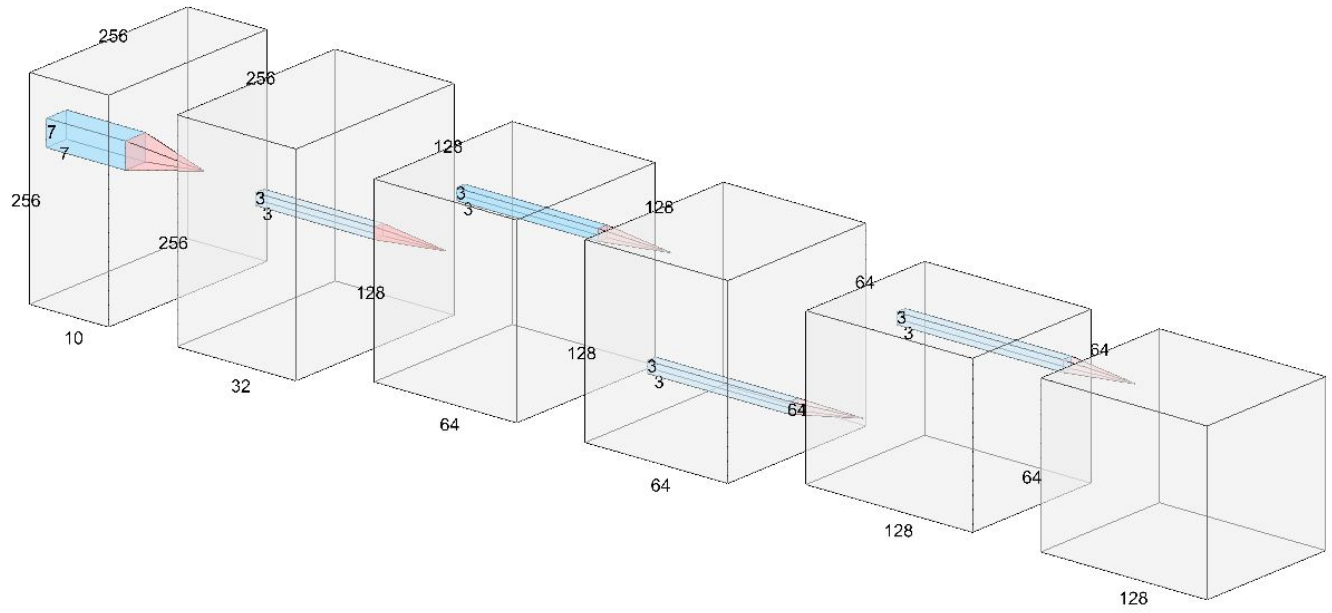
Comments and Disclaimer:

1. As mentioned in the main text, the present work demonstrates a prototype for a robust unsupervised ultrasound video key point pipeline. At present the system is trained and validated with ultrasound scans from various geographies obtained from different ultrasound machines by separate clinicians. Future work would include analyzing the proposed system with better pruned US scans i.e. data from distinct machine vendors, standardized ultrasound scans with specific presets which are expected to further increase the performance of the proposed methodology.

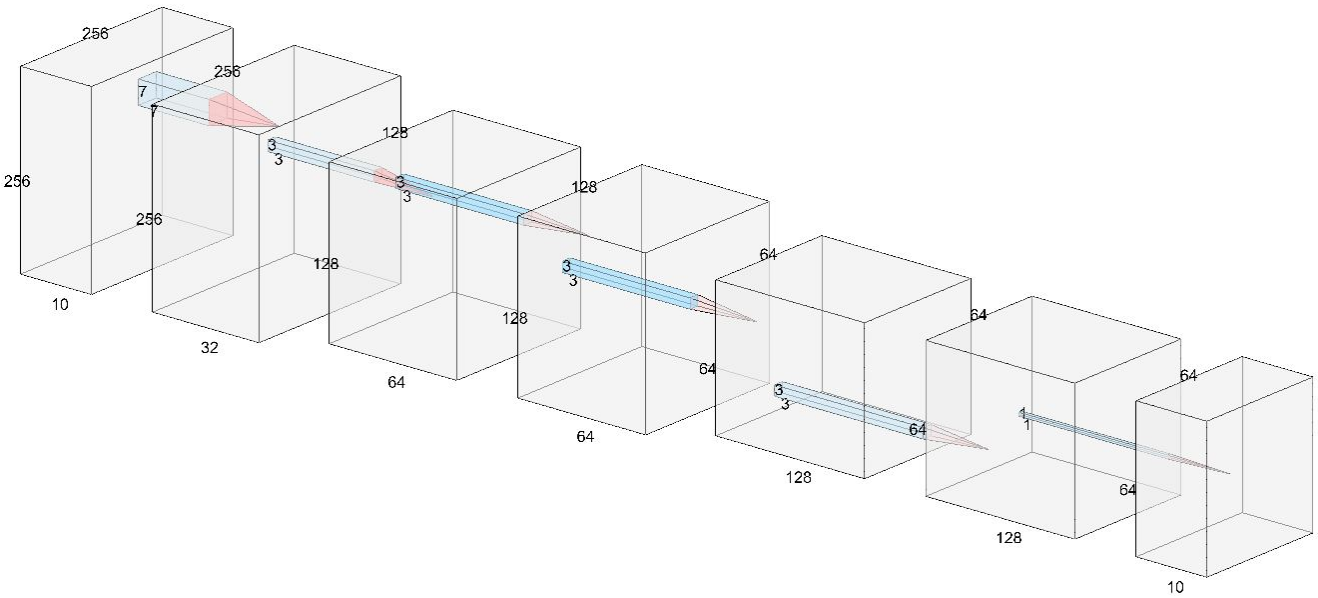
2. The following prototype is in development and should not be used as a substitute for a trained professional in making diagnostic decisions.

Supplementary Figures

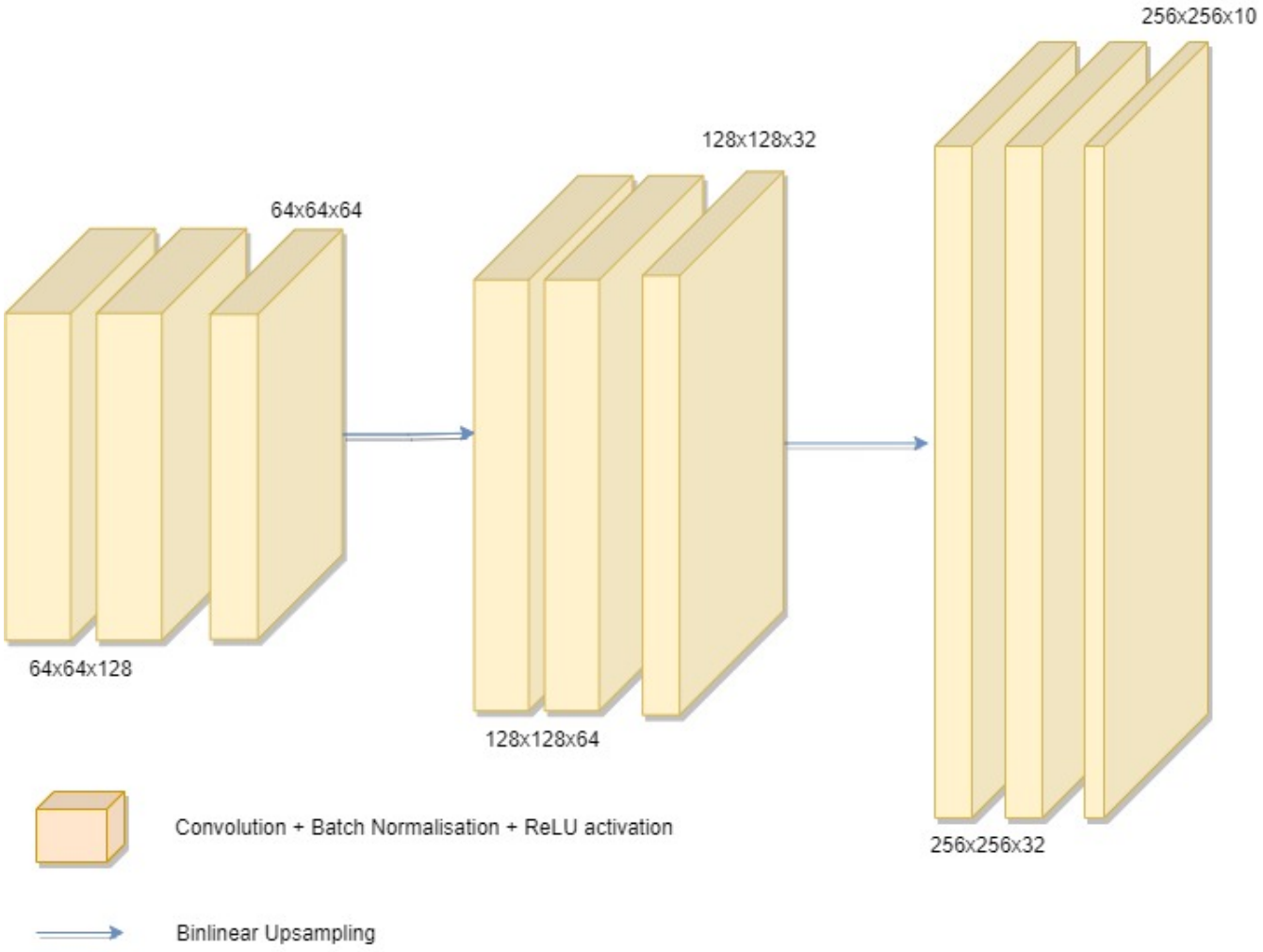
This section contains the additional figures which shows the architecture of FF-CNN, KeyNet, RefineNet and the effect of the controlled Radon transform on LUS images.



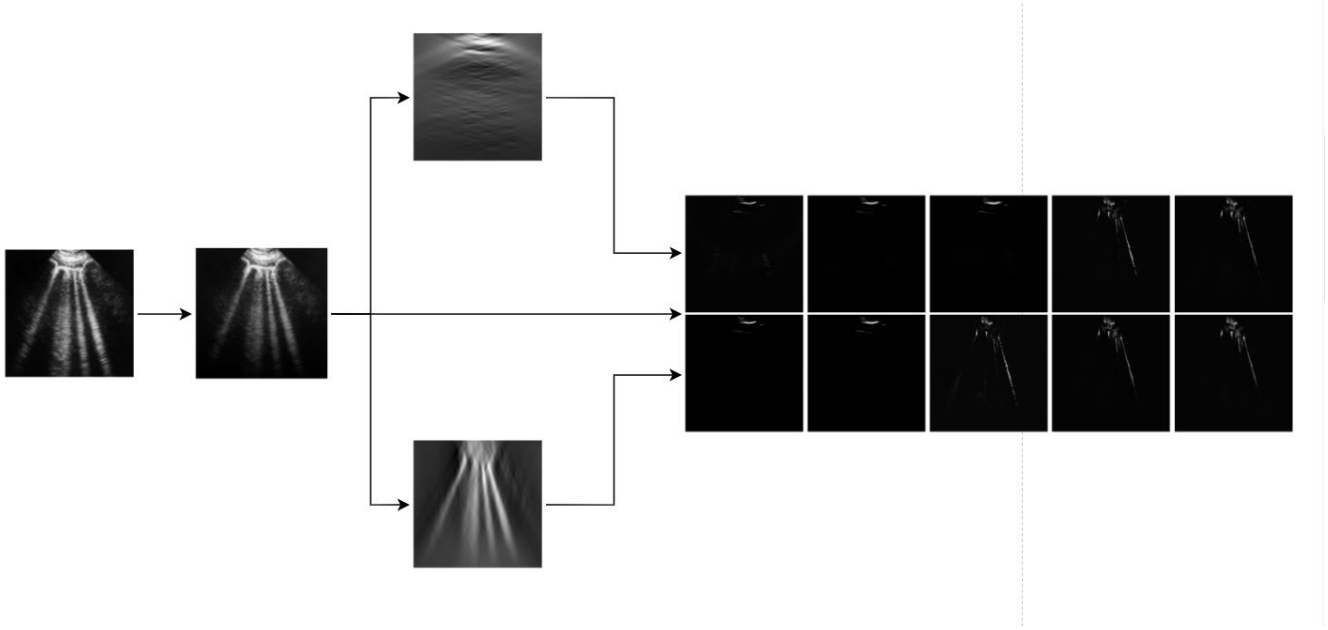
Supplementary Figure 1: Architecture for the FF-CNN in Transporter network, each block consists of Convolution operation followed by Batch Normalisation and ReLU Activation



Supplementary Figure 2: Architecture for the KeyNet CNN for k=10 in Transporter network, each block consists of Convolution operation followed by Batch Normalisation and ReLU Activation, the final output of the CNN is further used for Gaussian approximation as seen in Figure 3



Supplementary Figure 3: Architecture for the RefineNet for k=10 in Transporter network, the input to the network is the transported feature map obtained with Algorithm 1, each block consists of Convolution operation followed by Batch Normalisation and ReLU Activation, the final output of the KeyNet is considered as the reconstruction of the representation of target frame, i.e, $T\left(x_{t+i}, \lambda_0\right)$



Supplementary Figure 4: DGA + RT-FPM preprocessing pipeline (refer Figure 1) of Lung Ultrasound frame with Septal Rockets, note that DGA attenuates the lower section of the raw frame in this case