



## **Learning Interclass Relations for Intravenous Contrast Classification in CT**

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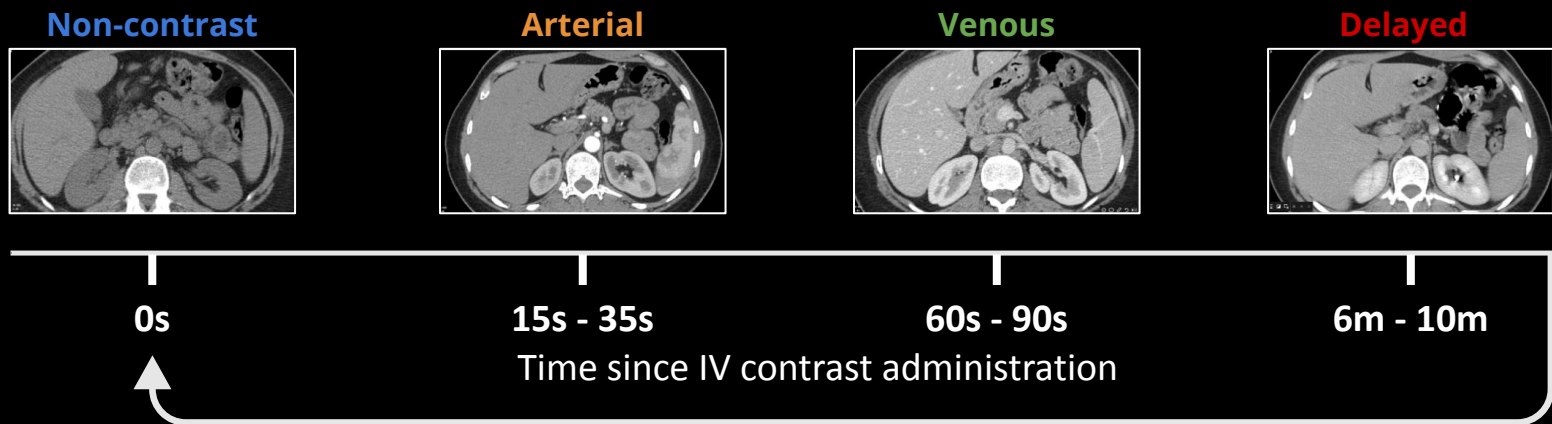
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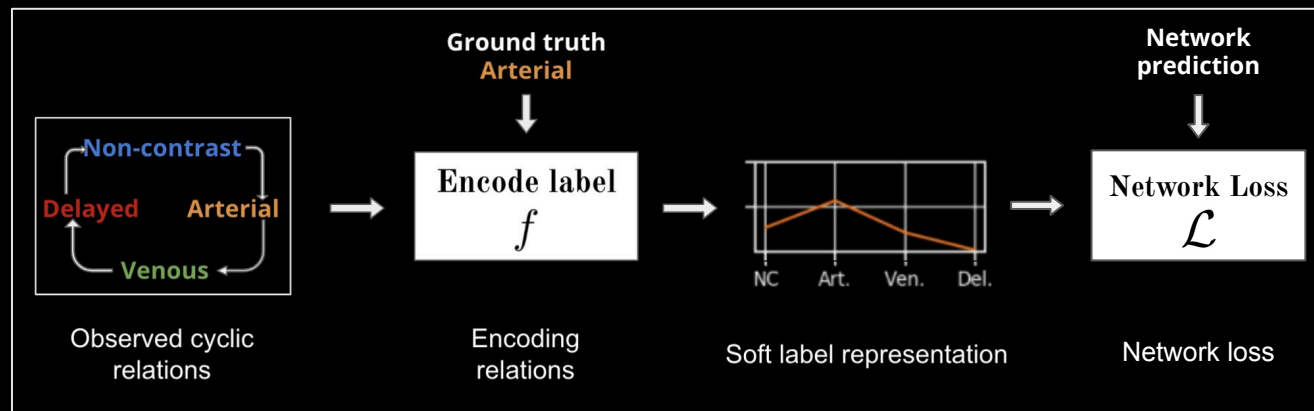
# Learning Interclass Relations for IV Contrast in CT

1. We demonstrate that introducing relations between clinical categories into classification network supervision improves performance and lessens the need for large datasets
2. We propose new approaches and demonstrate that interclass relations between clinical categories can be implicitly learnt from data during training, alleviating the need for strong prior assumptions with the same benefits

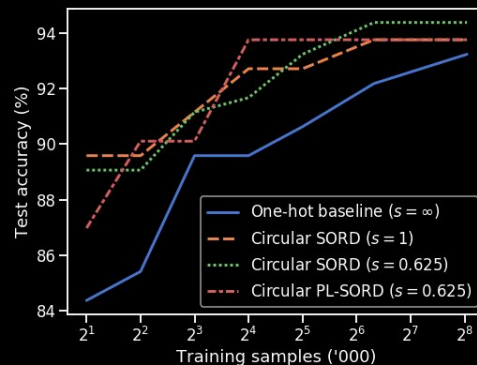


# Encoding Categorical Relations - Known or Unknown

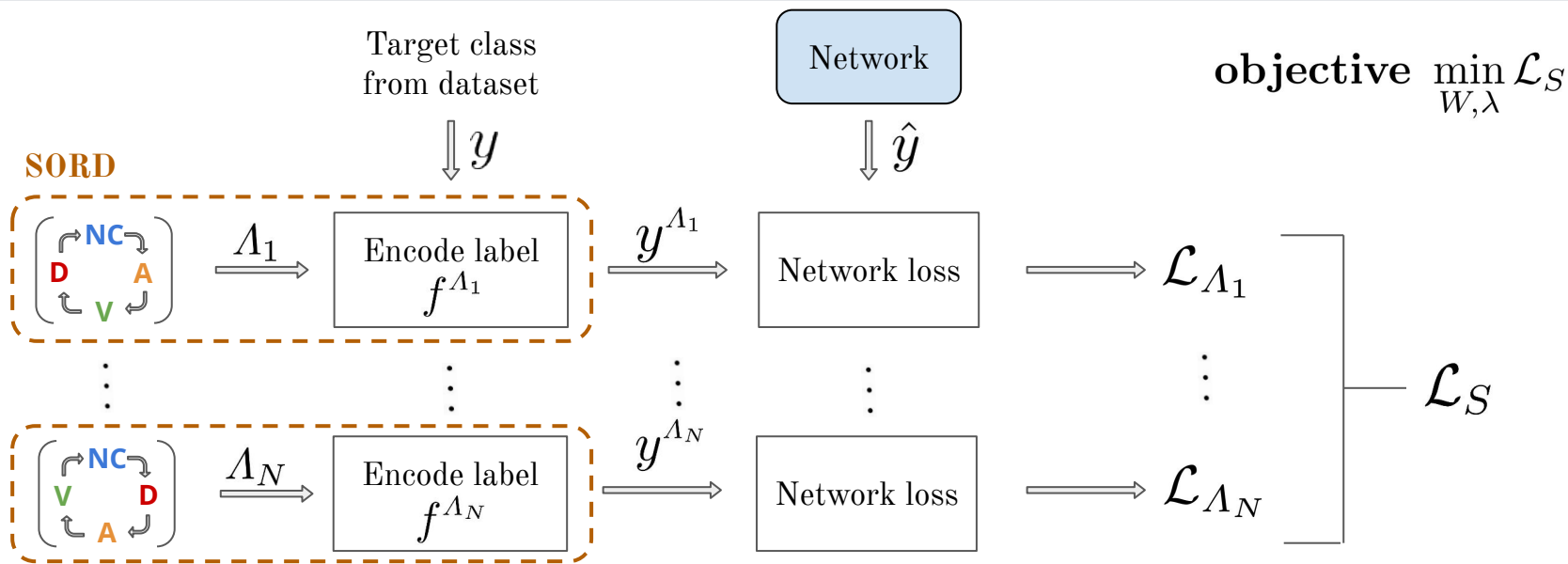
The label encoding  $f$  can be predefined, or learnt based on the network loss and training data



Incorporating interclass relations in label encodings improves performance across a range of dataset sizes over a one-hot encoding baseline, and most notably for **small** training sets



# PL-SORD - Learning an ordinal label encoding from data



(A)  
Defined set of  
possible relations

(B)  
Encode label  
representations

(C)  
Network loss  
evaluated vs each  
label encoding

(D)  
Softmax-weighted sum  
of order-specific losses