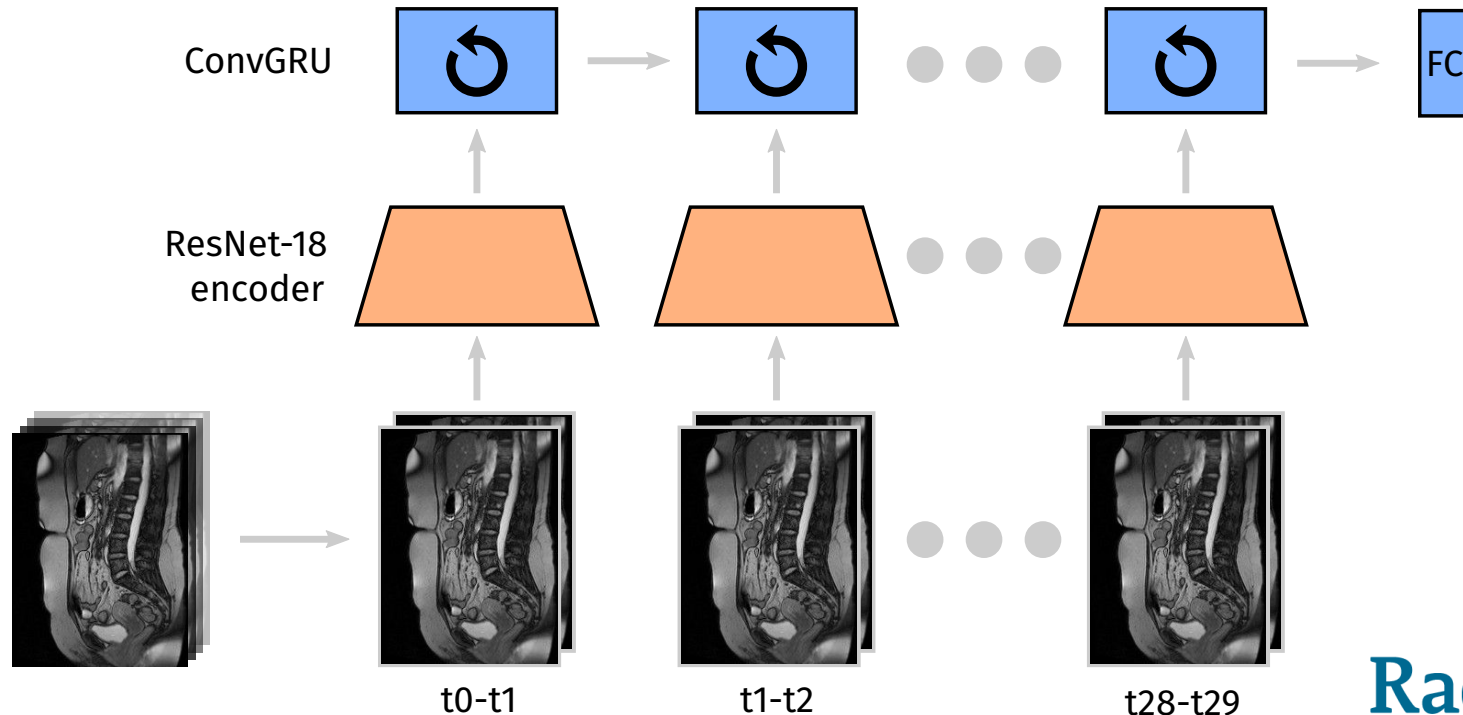


Cine-MRI detection of abdominal adhesions with spatio-temporal deep learning

Bram de Wilde, Richard P. G. ten Broek, Henkjan Huisman



Clinical context

Patients develop chronic postoperative pain

50% is caused by adhesions

Cine-MRI is a novel non-invasive modality

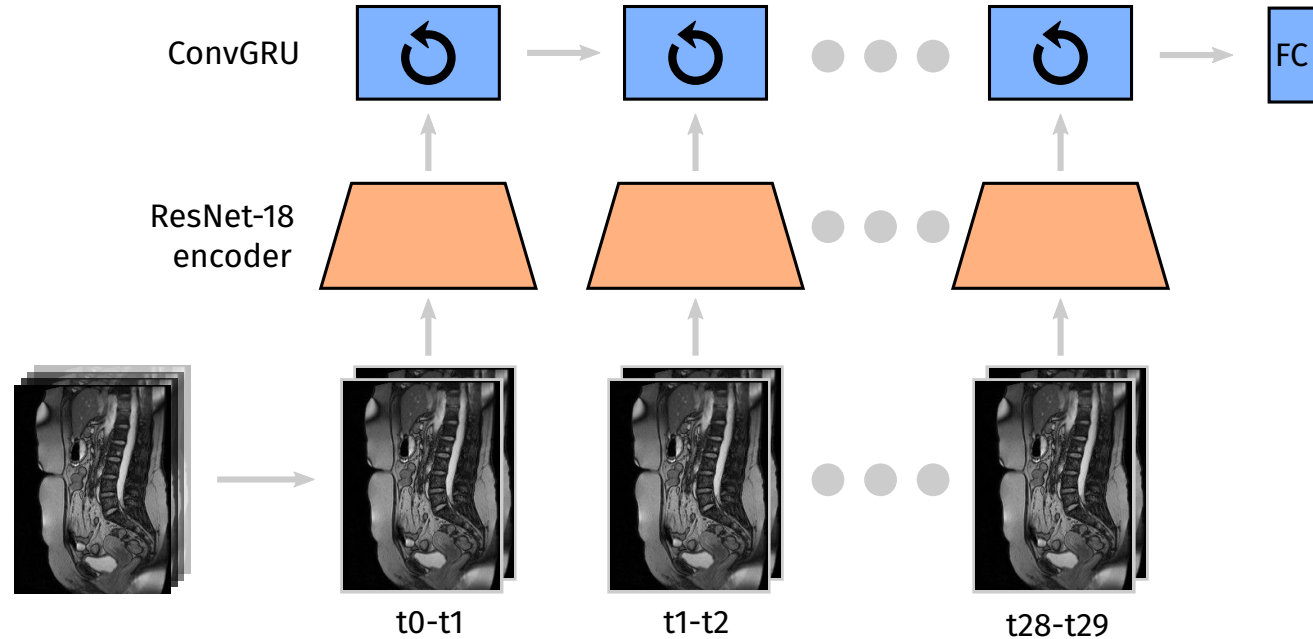
Data

104 2D+time series of 63 patients

Binary labels from expert radiologist

Dimensionality: 30 x 256 x 192

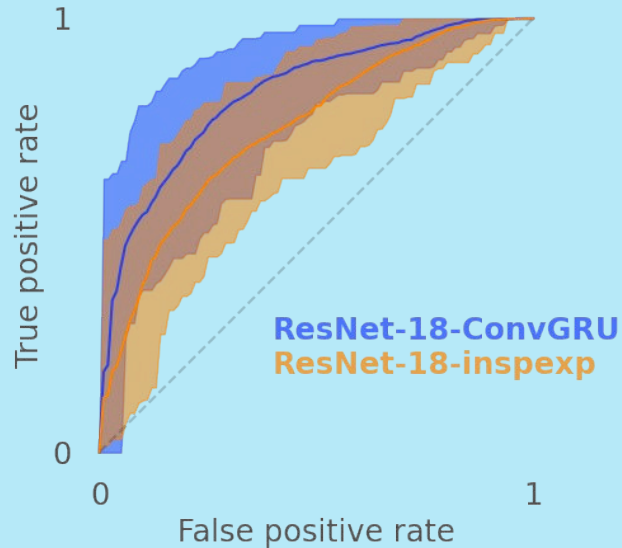
Architecture



Baseline: ResNet-18 that receives inspiration/expiration frames

Full architecture: ResNet-18 encoder with lightweight ConvGRU

Results



5-fold cross validation AUC

ResNet-18-ConvGRU: 0.83 (0.70-0.93)

ResNet-18-inspexp: 0.74 (0.60-0.87)

Significant difference ($p=0.002$)

Conclusion

Temporal modeling with ConvGRU significantly improves performance

Adds only 5% of weights

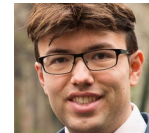
Future: saliency maps and detection

Team



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