

Medical Imaging with Deep Learning (MIDL 2018) Conference: What is Hot?

Last week, [I dived into the world of rejected extended abstracts](#) from the first ever deep learning conference focused on medical imaging ([MIDL 2018](#)) organized in Amsterdam this summer. This week I am in the mood for the opposite end, namely the glorious world of accepted papers for oral presentation!

According to NVIDIA's [conference highlights slides](#), acceptance rates were 41% and 35% for papers and abstracts respectively. There were 21 oral presentations and 26 full paper and 35 abstract poster presentations (all presentations, code, slides etc. are [here!](#)). Based on these numbers, it seems that around 115 full papers were submitted and around 100 extended abstracts were submitted.

As in the case of rejected abstracts, I look at the reviewer comments as well as the papers themselves located [here](#). My goal is to see what topics are hot and what innovations were valued by this community and why.

Some novel(*ish*) things that were praised:

- **Reinforcement Learning** Considering all the fuss about deep reinforcement learning from Deepmind few years ago, one would have thought this was also applied to medical imaging. Alas, the [reviewers were pretty impressed](#) with the *relative* novelty of applying reinforcement learning in medical imaging, specifically in anatomical landmark detection. Video presentation is [here](#)
- **Attention U-Net** Combining attention mechanism into U-Net has *not* been done before?? This is very surprising to me given that both ideas have been around for a couple years already. In this case, the [architecture](#) is applied to detection of pancreas in large CT abdominal datasets. Video presentation is [here](#).
- **Capsules for Object Segmentation** Hmmm..yet another idea that caused quite a buzz in 2017 (Hinton's talk [here](#)) and somehow was applied to image segmentation only recently in 2018! The authors created an capsule-based architecture named [SegCaps](#) that reduced the number of parameters of U-Net 95.4% while still providing a better segmentation accuracy. Video presentation is [here](#)
- **Neural Conditional Random Fields on top of a CNN**. Especially on WSI (digital pathology) domain, images are divided into tiles for processing due to their large sizes. However, such processing can't adequately model spatial correlations between the tiles. The authors [here are proposing](#) to place a CRF on top of the CNN and train it end-to-end for WSI of breast cancer. Although the idea is not brand-new, the application is pretty novel. Video presentation is [here](#).
- **Adversarial training with cycle consistency**. Video presentation is [here](#).
- **OBELISK - One Kernel to Solve Nearly Everything: Unified 3D Binary Convolutions for Image Analysis** This paper actually won NVIDIA's best [conference highlights slides](#) paper award for this conference. Video presentation is [here](#).