From: **Sérgio Pereira** pereirasrm@gmail.com
Subject: Re: Replication of BraTS paper using ConvNets
Date: 22 March 2017 at 10:33
To: Sebastian Borgeaud spb61@cam.ac.uk
Cc: Duo Wang wd263@cam.ac.uk, Mateja Jamnik mj201@cam.ac.uk

SP

Hi Sebastian!

First of all, thanks for your interest in our work.

1) No. For the results obtained with BRATS Challenge 2013 I trained on the BRATS 2013 Training data. Note that the manual segmentation were obtained differently in BRATS 2013 and BRATS 2015. In 2013 it was obtained by fusing the manual annotation of experts. But, for 2015 the organizers fused the segmentations obtained by top performing automatic segmentation methods. When I look at both, they look different to me, even for the same subjects. This can be one of the reasons. Note also that we have a CNN for HGG and another for LGG.

2) In [19] the authors applied N4ITK to the T2 and FLAIR sequences also. In any case, the difference is still large. Maybe it's a matter of N4ITK parameters. After publishing the paper, another contestant of BRATS told me that he did not use N4 because it kind of "erased" some tumors when he tried it. Anyway, I used N4ITK through the Nipype package with the following parameters:

```
from nipype.interfaces.ants import N4BiasFieldCorrection
n4 = N4BiasFieldCorrection()
n4.inputs.n_iterations = [20, 20, 20, 10]
n4.inputs.dimension = 3
n4.inputs.bspline_fitting_distance = 200
n4.inputs.shrink_factor = 2
n4.inputs.convergence_threshold = 0
```

maybe you can try this parameters in the implementation that you are using.

3) Yes. After we extract all patches we had around 40% of normal tissues and the remaining approximately balanced among the tumor classes. We also tried to avoid to extract patches that were too close to each other (around 3 voxels apart). Also, we enforced that around 30% of the normal tissues patches should be close to the tumor itself. However, I am afraid that I cannot guarantee that this
had a big impact, since I had no time to validate at the time. In my more recent approaches it did not impact much.

Hope this helps.

Cheers,
Sérgio