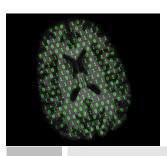# THEME 3 / LECTURE 9: PRE-PROCESSING WITH ANTSR
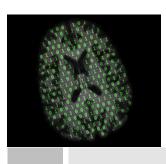
Pre-processing with ANTsR
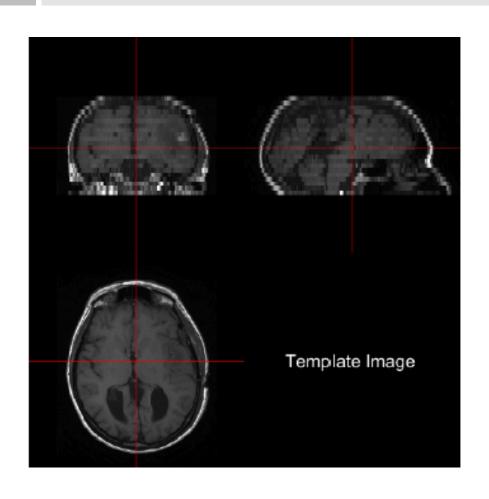
- ☐ Bias field correction (N4)
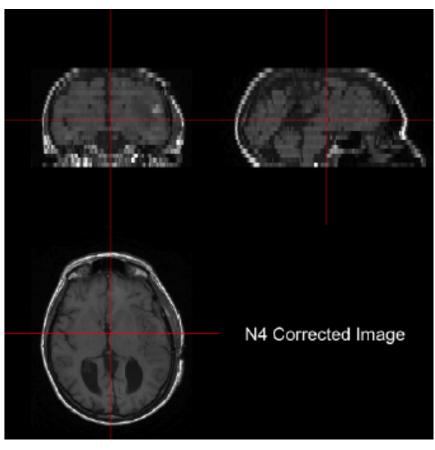- ☐ Registration

Wrapper Functions in `extrantsr`

- Bias field correction

- `extrantsr::bias_correct` **wraps** `n3BiasFieldCorrection` **and** `n4BiasFieldCorrection` **from** `ANTsR` **for bias field correction:**
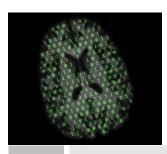
```
n3img = bias_correct(nim, correction = "N3",retimg=TRUE)
n4img = bias_correct(nim, correction = "N4",retimg=TRUE)
```
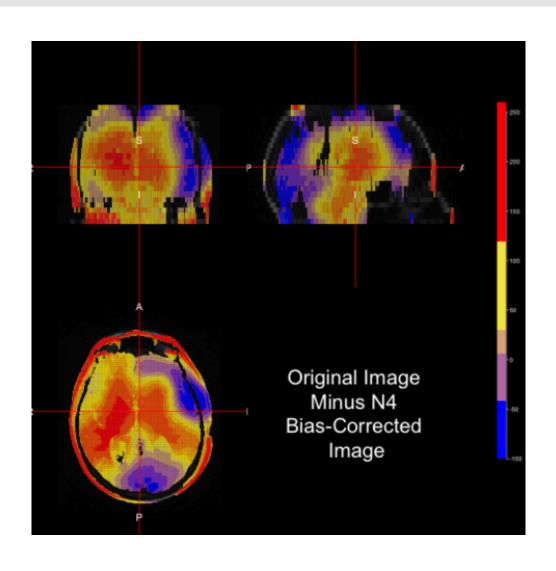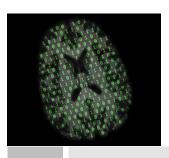
Bias Field Correction with ANTsR

Template Image

N4 Corrected Image

fslr: Original-N4 Bias Field Corrected Image

Original Image Minus N4 Bias-Corrected Image

Wrapper Functions in `extrantsr`

- Image registration

- ANTsR **worker function:** `antsRegistration`

- `extrantsr` **worker function:** `ants_regwrite`

- `ants_regwrite` takes in a filename and a template filename. The image in the filename is transformed to the space of the template filename

```
registered_n4 = ants_regwrite(filename=n4img,
template.file = template, remove.warp = TRUE,
typeofTransform = "Rigid")
```
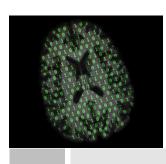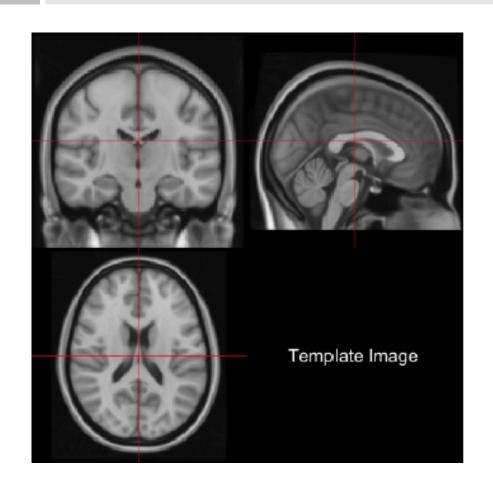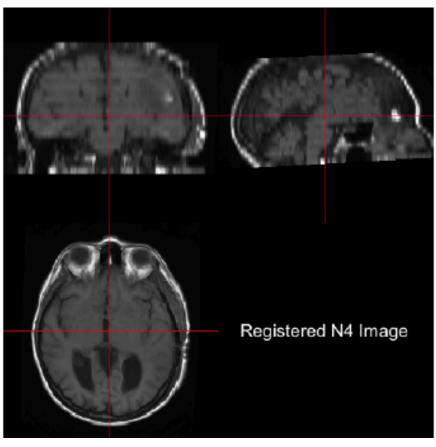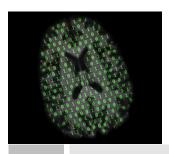
Image Registration with ANTsR

Template Image

Registered N4 Image

Other Options for Registration

```
typeofTransform = "Rigid", "Affine", "SyN"
```