## Supervised Deep Learning Image Registration

1. **Rigid Image Registration.** Implement simple rotation (with randomly generated angle $\theta \in [0, 60°]$) and translation (with randomly generated translation $T \in [-5, 5]$). Use these transformations to deform the provided images (you are welcome to use the provided function 'Torchinterp' in file 'Reg_Tools.py' to deform images).

2. **Supervised Image Registration.** This task is to predict deformable transformations between pairwise images by provided pre-trained deep learning image registration models (DeepFLASH). The pretrained model on 3D brain images ($128^3$) is provided in 'PretrainedReg.tar'. You are required to complete the code in 'Reg_Main.py' to use the predicted initial velocity in Fourier space ($16^3$) to (i) generate final transformation $\phi_1$ by the geodesic shooting algorithm, and (ii) deform the source image to match the target.