**How would an image on the cortex look on the scalp?**

Step 1. Fit of a sphere to the brain mesh

A green brain in a wireframe sphere

Description automatically generated

Step 2. More accurate projection (not deformed) of image on sphere (like a clothe landing on a sphere).

A close up of a bird

Description automatically generatedA close up of a bird

Description automatically generated

Step 3. Placing the image on the spherical mesh

A blue brain with a colorful image of a bug on it

Description automatically generated

Step 4. Relocating and scaling the image to a desired location

A close up of a human brain

Description automatically generated

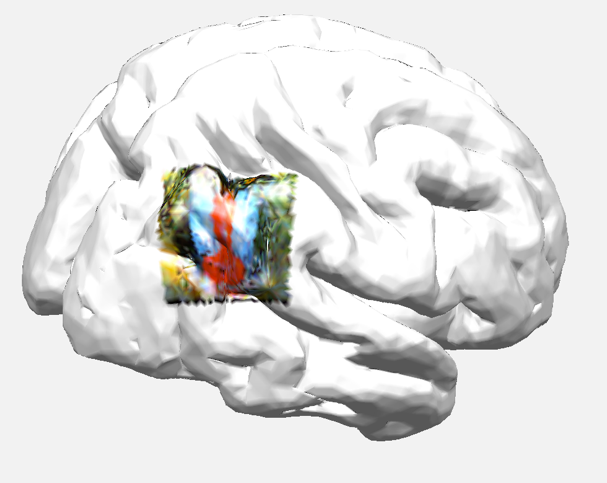
Step 5. Projecting image on Cortex

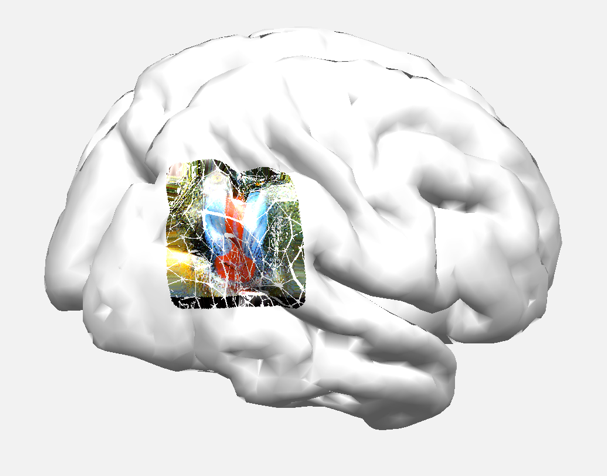
A white brain with multicolored center

Description automatically generated

Step 6. Refining mesh resolution and smoothing

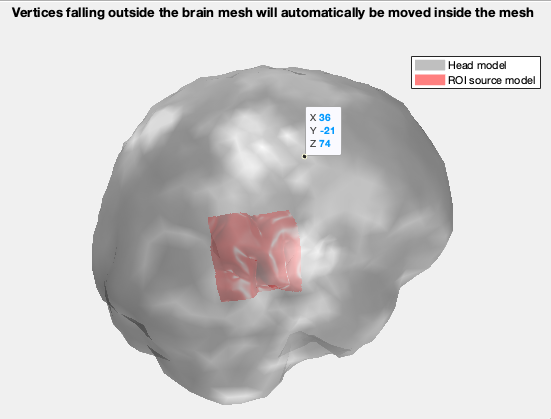
A white brain with multicolored spots

Description automatically generated 

 A close-up of a brain

Description automatically generated

Step 7. Aligning mesh (source model) with head model



Step 8. Computing forward solution and projecting on 345 channels (headplot) and 1042 vertices (custom code)

A green and black object with black dots

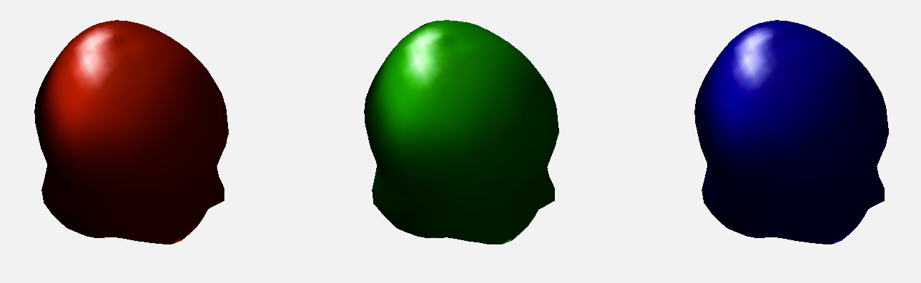
Description automatically generated A colorful head with black dots

Description automatically generated

Step 9. Projecting all 3 colors on a head mesh



Same as above, separated by color channels



**Limitation**

* Source orientation is always (1,1,1) and not radial or normal. That could potentially create issues with projection. However, I tried other fixed orientation and the result was almost the same.

**Perspectives:**

* Activate larger areas of cortex so we can differentiate on the scalp
* Visualize projected movies (see movie folder)
* Have 2 sources and mix them at the vertex level, then project them
  + Try to separate them using ICA
  + Test their distance and overlap
  + Test their focus (very local or larger)
  + Test adding noise
* With enough data, simulate a simple 20 x 20 image (400 sources), project it on the brain mesh, then on the scalp and try to reconstruct them using ICA. Grey color equals spectral power.

