School Logo here

Your title here: Maybe add some pictures and/or school logo on the left

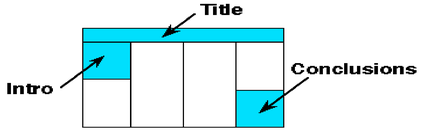
authors and affiliation (First names of authors increase interaction potential)

Section 1 (sizes):

- Posters boards are 48” tall and 96” wide, but we recommend you leave a little border since you may not be able to pin at the vertical edge. Since PowerPoint does not let one define such a large paper size, this template is designed to be printed at 200%, yielding a 46” x94” poster. You can scale it up or down a bit (e.g. 42” is a common paper size at FexEd). Note there is no direct international A0.. A1 equivalent. The poster size is approximately three A0 boards next to each other, i.e., each column in this example is about one A0 board.

- Ideally you want to keep it very readable: this is not your paper, it is a poster. 32pt here (64 final printing) is good for most text:
  - Sub-bullets are 28 here (56 final)
  - Don’t use smaller than 24pt in this template (which is 48pt in final printing at 200%)
  - Insert plenty of graphics and any math you need

- When inserting graphics or equations, keep the resolution high (remember this will be printed at 200%). If you can see blocking artifacts at 400% magnification in PowerPoint, consider finding better graphics. This is an example of BAD/LOW RES GRAPHICS



- Leave enough margin for pushpin and remember many big plotters cannot get within .5” of the actual paper edge.

- You are free to use colored backgrounds and such but they generally reduce readability.

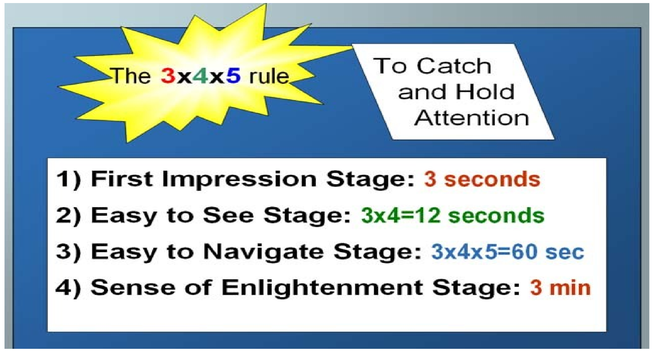
- You are free to use what ever fonts you like.
  - San Serif fonts like Arial are more readable from a distance,
  - Serif fonts like times may look more consistent with your mathematics

Section 2 (layout):

- Remember the poster session will be crowded so design the poster to be read in columns so people can read what is in front of them and move left to right to get the whole story.

- The poster should use photos, figures, and tables to tell the story of the study. For clarity, present the information in a sequence that is easy to follow.

- There is often way too much text in a poster - there definitely is in this template! Posters primarily are visual presentations; the text should support the graphics. Look critically at the layout. Some poster 'experts' suggest that if there is about 20-25% text, 40-45% graphics and 30-40% empty space, you are doing well.



Section 3:

- Include more figures than are in the paper so you can talk to them. Include things that are not in the paper and then encourage them to read the paper. Don’t try to just put all the paper here.

- If it looks like a cut/paste of the paper, people skip that poster since they can read the papers after the conference. Many people find it better to spend time talking with poster presenters that have more to offer than just redoing the paper content paper in big fonts.

- People will likely have already seen your posted video, so the poster can serve as a talking point for you.

- Remember Poster boards look like this.. This is your canvas. Paint us a picture of your work.

Summary/Conclusion

- Summarize your contributions

- Summarize your results (if applicable)

- **You an add in links to additional videos, code, or project website (or QR code)**

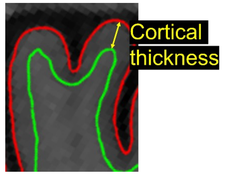
References

Vox2Cortex: Fast Explicit Reconstruction of Cortical Surfaces from 3D MRI Scans with Geometric Deep Neural Networks

Fabian Bongratz[1], Anne-Marie Rickmann[1;2], Sebastian Pölsterl[2], Christian Wachinger[1;2]
[1]Artificial Intelligence in Medical Imaging (AI-Med, www.ai-med.de), Technical University of Munich, Germany
[2]Ludwig-Maximilians-University, Munich, Germany

Accurate brain surfaces extracted from MRI are required for

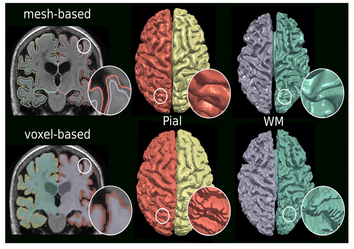
- Radiomics
- In-vivo measurements, e.g., cortical volume, thickness, sulcal morphology, etc.
- Study of neurodegenerative diseases like Alzheimer's



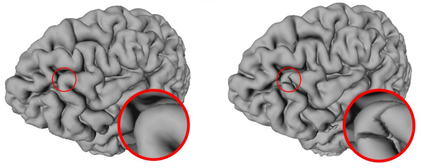
Vox2Cortex vs. FreeSurfer [1] (not deep learning-based)

<20 secs >4 hrs

Vox2Cortex vs. UNet [2] (voxel-based segmentation)

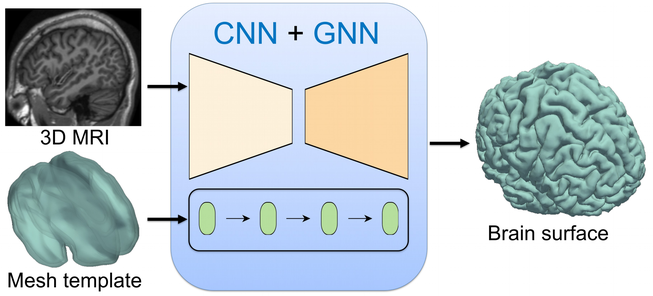


Vox2Cortex vs. DeepCSR [3] (implicit surfaces)



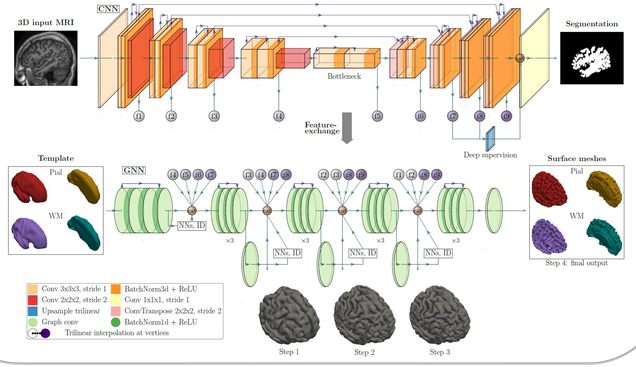
[1] B. Fischl. "FreeSurfer". In: Neuroimage 62.2 (2012), pp. 774–781
[2] F. Isensee, P. F. Jaeger, S. A. A. Kohl, J. Petersen, and K. Maier-Hein. "nnU-Net: a self-configuring method for deep learning-based biomedical image segmentation." In: Nature methods (2020)
[3] R. S. Cruz, L. Lebrat, P. Bourgeat, C. Fookes, J. Fripp, and O. Salvado. "DeepCSR: A 3D Deep Learning Approach for Cortical Surface Reconstruction". In: 2021 IEEE Winter Conference on Applications of Computer Vision (WACV) (2021)

Combination of CNN and graph neural network yields meticulous brain surfaces within seconds



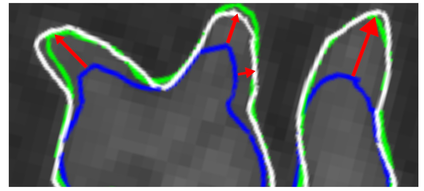
- ✓ First-time combination of CNN + GNN for cortical surface reconstruction from MRI
- ✓ Spherical topology through deformation of brain-specific template
- ✓ Modeled interdependency between brain surfaces
- ✓ Novel curvature-weighted Chamfer loss function
- ✓ State-of-the-art brain surfaces

Vox2Cortex architecture



Loss function

Curvature-weighted Chamfer loss



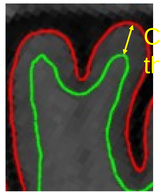
$$\mathcal{L}_C(\mathcal{M}^{\mathrm{p}}_{s,c}, \mathcal{M}^{\mathrm{gt}}_{c}) = \frac{1}{|\mathcal{P}^{\mathrm{gt}}_{c}|} \sum_{\mathbf{u}\in\mathcal{P}^{\mathrm{gt}}_{c}} \kappa(\mathbf{u}) \min_{\mathbf{v}\in\mathcal{P}^{\mathrm{p}}_{s,c}} \|\mathbf{u}-\mathbf{v}\|^2 + \frac{1}{|\mathcal{P}^{\mathrm{p}}_{s,c}|} \sum_{\mathbf{v}\in\mathcal{P}^{\mathrm{p}}_{s,c}} \kappa(\tilde{\mathbf{u}}) \min_{\mathbf{u}\in\mathcal{P}^{\mathrm{gt}}_{c}} \|\mathbf{v}-\mathbf{u}\|^2$$

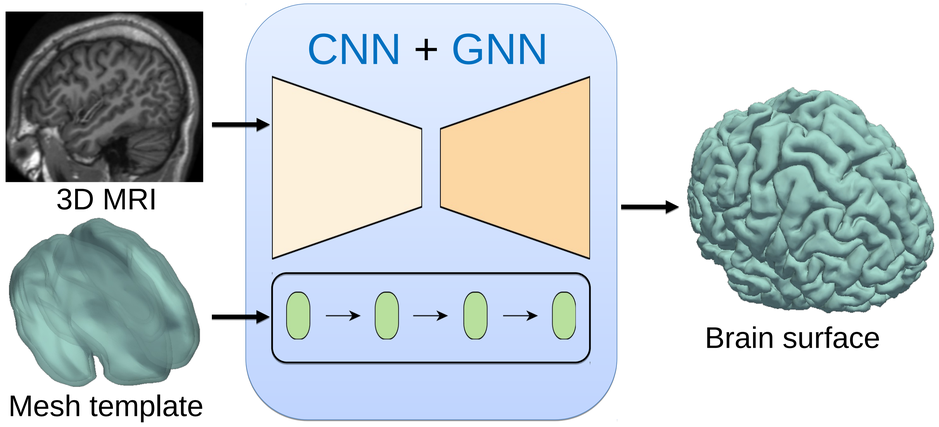
Total loss function

$$\mathcal{L}(y^{\mathrm{p}}, y^{\mathrm{gt}}) = \underbrace{\mathcal{L}_{\mathrm{vox}}(y^{\mathrm{p}}, y^{\mathrm{gt}})}_{\mathcal{L}_{\mathrm{vox}}(y^{\mathrm{p}}, y^{\mathrm{gt}}) = \sum_{l=1}^{L} \mathcal{L}_{\mathrm{BCE}}(B^{\mathrm{p}}_{l}, B^{\mathrm{gt}})} + \underbrace{\mathcal{L}_{\mathrm{mesh}}(y^{\mathrm{p}}, y^{\mathrm{gt}})}_{\mathcal{L}_{\mathrm{mesh}}(y^{\mathrm{p}}, y^{\mathrm{gt}}) = \mathcal{L}_{\mathrm{mesh},\,cons}(y^{\mathrm{p}}, y^{\mathrm{gt}}) + \mathcal{L}_{\mathrm{mesh},\,reg}(y^{\mathrm{p}})}$$

Chamfer (point) + normal loss

Surface regularity


Cortical
thickness


CNN + GNN
3D MRI
Mesh template
Brain surface