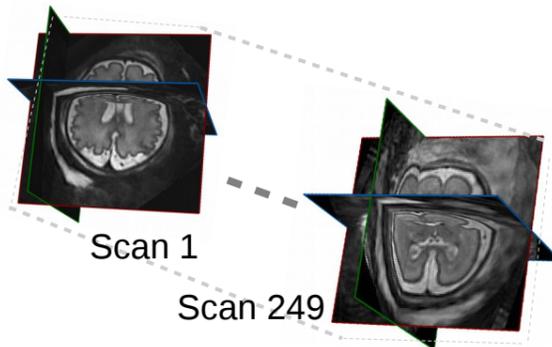




dHCP fetal cohort, 3T

1 **Pre-processing:**

Brain localization, slice alignment, registration, and reconstruction.



2 **Draw-EM:**

Preliminary labels generated by leveraging a fetal brain atlas.

held-out-set-A (n=86, 3T)

held-out-set-B (n=12, 3T)

8 **Final evaluation:**

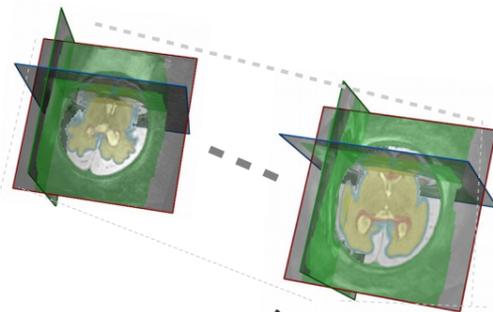
The final cortical segmentation system was applied to the 86 volumes from held-out-set-A and 13 volumes from the independent 1.5 T dataset.



Expert Annotator

5 **Clinical refinement of output from SN1:**

Segmentation maps of 283 slices, generated by SN1, are evaluated and refined by an experienced annotator.



3 **Evaluation of preliminary labels:**

A quality control step; only images that pass are used to train the deep segmentation network.

fail (n=59, 3T)



pass (n=92, 3T)

4 **DeepMedic:**

- A deep 9-class segmentation network (SN1) is trained, tuned, and assessed.
- It is also applied to scans that failed Draw-EM, for comparison.

7 **Fine-tuning the cortical segmentation network:**

- Refined cortical gray matter labels on the dHCP 3T slices were fed back to SN2.
- 28 Volumes from an independent 1.5T clinical dataset were also incorporated.

6 **DeepMedic (2):**

- A deep cortical segmentation network (SN2) is trained, tuned, and assessed.

model-development-set (n=49, 3T)

held-out-set-C (n=43, 3T)



Independent clinical cohort, 1.5T