Labeling performance using combined tertiary sulci

Table S.1

3 combined tertiary sulci with individual components.

Combined	Acronym	Region	Acronym	Region	Acronym	Region
pmfs	pmfs_p	posterior component of the posterior middle frontal sulcus	pmfs_i	intermediate component of the posterior middle frontal sulcus	pmfs_a	anterior component of the posterior middle frontal sulcus
imfs	imfs_h	horizontal component of the intermediate frontal sulcus	imfs_v	vertical component of the intermediate frontal sulcus		
fms	mfms	medial frontalmarginal sulcus	ifms	intermediate frontalmarginal sulcus		

Table S.2

Summary of average Dice overlap (mean $\pm$ stdev.) in combined tertiary sulci for the pediatric and adult cohorts. Legend: significant improvement ($p < .05$) for Non-rigid+Context* (*blue*) compared to the baseline methods; significant improvement for Non-rigid or Non-rigid+Context* (*black*) compared to the baseline methods.

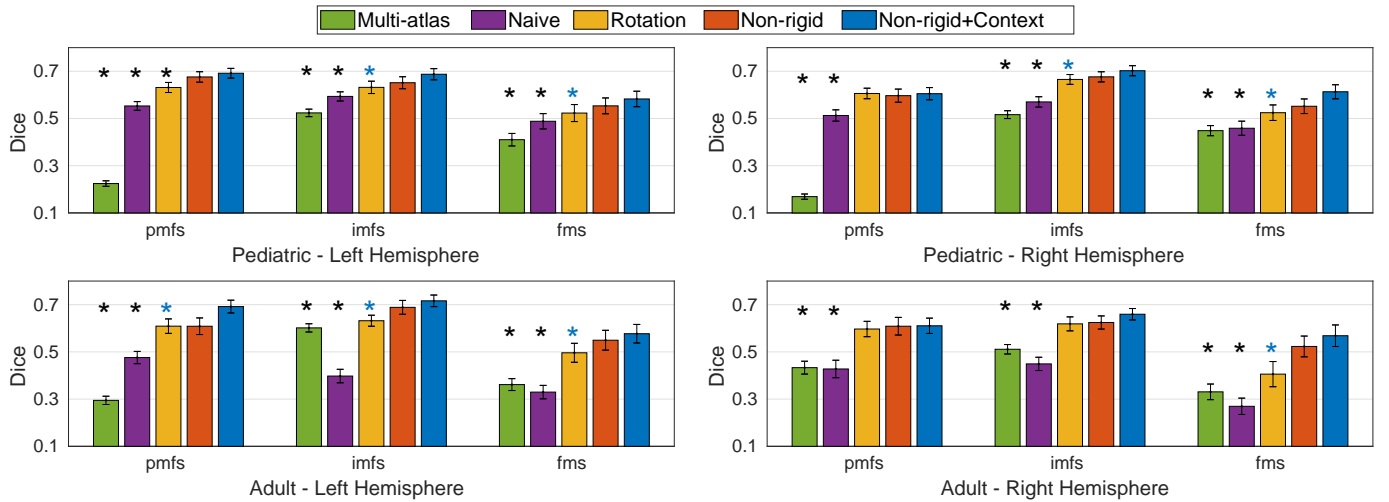|	Pediatric		Adult	
	Left	Right	Left	Right
Multi-atlas	.3860±.1013*	.3779±.0856*	.4193±.0888*	.4250±.1101*
Naive	.5449±.1287*	.5138±.1253*	.4011±.1179*	.3821±.1433*
Rotation	.5954±.1483*	.5986±.1402*	.5790±.1149*	.5404±.1680*
Non-rigid	.6269±.1388	.6083±.1437	.6156±.1489	.5854±.1604
Non-rigid+Context	.6539±.1260	.6402±.1496	.6617±.1091	.6128±.1403

Fig. S.1. Dice overlap per combined tertiary sulcus in pediatric (*top*) and adult (*bottom*) cohorts. The statistical significance is reported after multi-comparison correction over the 3 sulci (FDR at $q=.05$). The proposed data augmentation shows higher accuracy (Dice overlap) than the baseline methods. After the context-aware training, the Dice overlap is further improved compared to the conventional training with rotation data augmentation; left hemisphere: all sulci and right hemisphere: imfs and fms (pediatric) and fms (adult). Importantly, the proposed method does not perform worse than the baseline methods for any sulci. Legend: standard errors (hat); significant improvement compared to the baseline methods for Non-rigid+Context* (*blue*); for Non-rigid or Non-rigid+Context* (*black*).
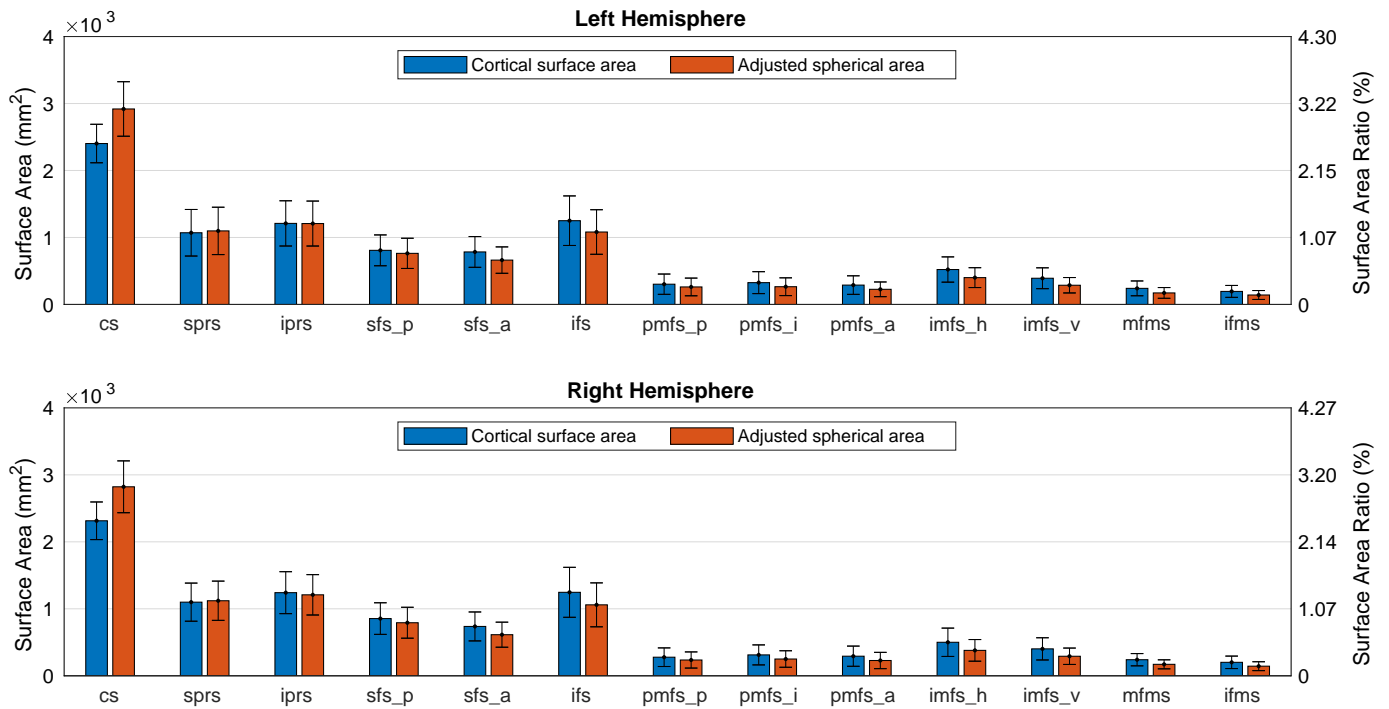
Spherical mapping distortion

Fig. S.2. Area distortion by spherical mapping in pediatric and adult cohorts. For each hemisphere, total spherical area is scaled by its associated total cortical surface area for comparison. See Table S.3 for absolute area difference of individual sulci between before and after spherical mapping.

	Left Hemisphere		Right Hemisphere	
Region	Surface area (mm^2)	Surface Area Ratio (%)	Surface area (mm^2)	Surface Area Ratio (%)
cs	515.91 ± 156.23	$.5512 \pm .1505$	507.49 ± 137.52	$.5401 \pm .1325$
sprs	47.97 ± 38.46	$.0508 \pm .0389$	49.74 ± 43.39	$.0527 \pm .0469$
iprs	39.93 ± 32.74	$.0424 \pm .0336$	59.07 ± 38.10	$.0625 \pm .0388$
sfs_p	51.95 ± 34.88	$.0559 \pm .0378$	66.87 ± 41.88	$.0718 \pm .0450$
sfs_a	121.85 ± 50.57	$.1313 \pm .0536$	123.27 ± 41.41	$.1323 \pm .0466$
ifs	168.87 ± 64.69	$.1815 \pm .0670$	186.90 ± 73.22	$.2000 \pm .0777$
pmfs_p	40.90 ± 25.25	$.0438 \pm .0261$	41.70 ± 24.82	$.0444 \pm .0257$
pmfs_i	60.73 ± 35.67	$.0652 \pm .0381$	61.50 ± 30.12	$.0657 \pm .0321$
pmfs_a	62.99 ± 31.92	$.0678 \pm .0348$	64.21 ± 31.35	$.0686 \pm .0324$
imfs_h	120.87 ± 47.00	$.1297 \pm .0495$	120.90 ± 54.66	$.1290 \pm .0563$
imfs_v	104.54 ± 43.73	$.1118 \pm .0435$	110.35 ± 46.40	$.1176 \pm .0466$
mfms	68.16 ± 31.98	$.0729 \pm .0327$	68.91 ± 26.86	$.0742 \pm .0303$
ifms	53.56 ± 23.65	$.0581 \pm .0264$	57.57 ± 28.34	$.0617 \pm .0299$

Table S.3

Absolute area difference of individual sulci between before and after spherical mapping in pediatric and adult cohorts. In the left (right) hemisphere, the average absolute difference of the whole sulci across the 96 subjects between the cortical surface area and associated spherical area is 112.17 ± 20.40 mm^2 (116.81 ± 19.92 mm^2), which is equivalent to $.1202 \pm .0180\%$ ($.1247 \pm .0183\%$) of the total surface area.