Supplementary for “MRI-Based Spectral Analysis of Fetal Brain Gyrification: Applications to Lissencephaly and Polymicrogyria”

Supplementary Table 1. Demographic information

	TD	LIS	PMG
Maternal age (years)	33 ± 6.4	28.9 ± 6.3	30.1 ± 4.4
Gestational age (weeks)	31.3 ± 2.7	28.9 ± 3.1	31.6 ± 2.5

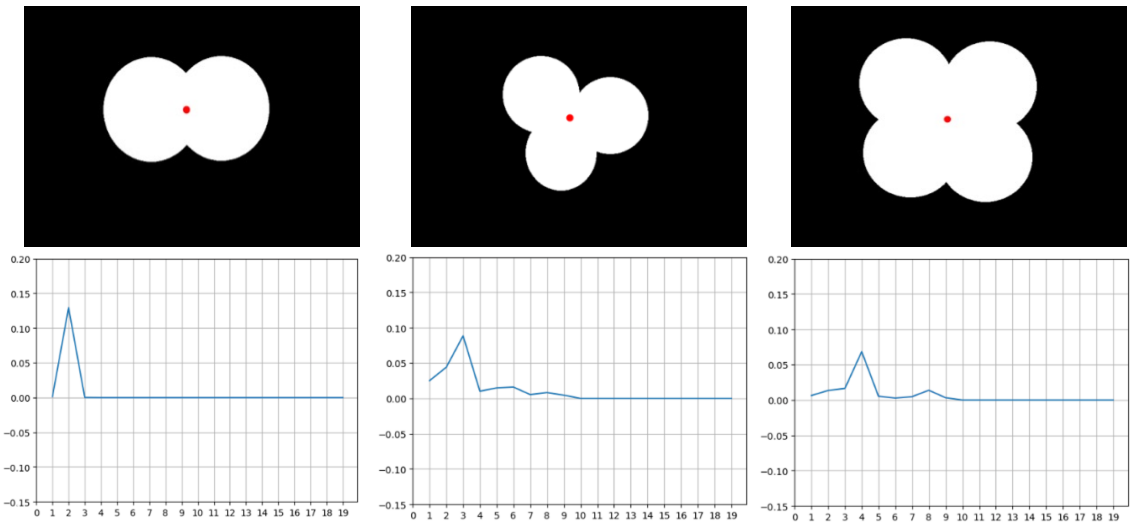
Data are presented as mean ± SD. Abbreviations: TD = typically developing; LIS = lissencephaly; PMG = polymicrogyria

Supplementary Table 2. Indications for MRI for cases with TD fetuses (N=73).

Indication	n, (%)
Previous pregnancy with central nervous system anomalies	11, (15.3)
Mild lateral ventriculomegaly	9, (12.5)
4^{th} ventricle anomaly	5, (6.9)
Microcephaly by US	5, (6.9)
Family genetics	3, (4.2)
Corpus callosum malformations by US	3, (4.2)
Eye malformation by US	2, (2.8)
Club foot	1, (1.4)
Spinal bifida	1, (1.4)
Others	32, (44.4)

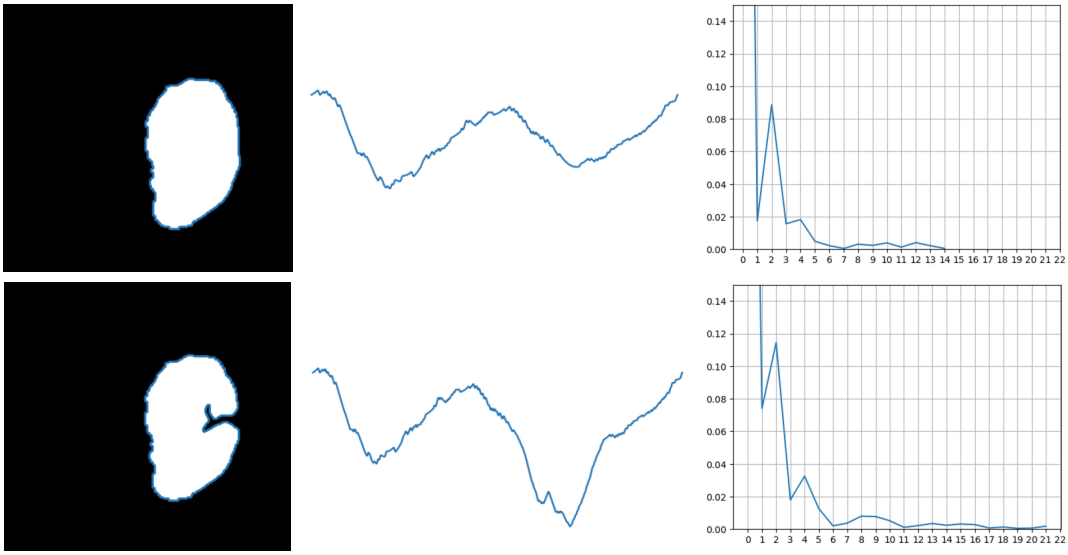
Data are presented as n, (%). Abbreviations: US = ultrasound

Supplementary Figure 1. Spectral representation of geometrical shapes



Spectral analysis of the three basic shapes demonstrates progressive increases in structural complexity. The red dot denotes the center of mass. The bilobar configuration exhibits a dominant peak at frequency 2, corresponding to two oscillations around the center of mass, whereas the tri-lobar and quad-lobar configurations show dominant peaks at the 3rd and 4th frequency components, respectively.

Supplementary Figure 2. Frequency decomposition with and without the Sylvian fissure



Spectral analysis of a single hemisphere with and without the Sylvian fissure. A1-A3 is the original convex hull, the polar transformation of the contour and its spectral representation. B1-B3 demonstrate the convex hull with the original Sylvian fissure, the polar transformation of the contour and its spectral representation. The main difference between the final spectral representation lies in frequency 1.