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Surface-based Atlases of Cerebral Cortex: Visualization and Data-Mining using Caret, WebCaret, and SumsDB Software

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This demonstration will illustrate a new set of surface-based atlases for human (PALS atlas) and monkey cerebral cortex, along with software tools for visualization, analysis, and data mining. (1) Caret 5.5 (http://brainvis.wustl.edu/caret/) is brain-mapping software for visualization and analysis of surfaces and volumes of individual brains and population-average atlas brains. A tutorial document and associated atlas data set (http://sumsdb.wustl.edu/sums/directory.do?id=6585200) provide self-guided instructions. (2) SumsDB (http://sumsdb.wustl.edu/sums) is a database that emphasizes experimental data mapped to surface reconstructions of atlases and individuals. (3) WebCaret is an online surface visualization tool launched from within SumsDB that allows immediate visualization of public data sets in the database, including atlas surfaces and volumes, plus the results of database searches for activation foci reported in stereotaxic space and for fMRI activation patterns mapped to the PALS atlas surface. (4) Caret and WebCaret can communicate with CoCoMac and other databases in ways that illustrate the utility of federation across neuroscience databases. Together, these software tools and data sets provide powerful options for coping more effectively with the explosion of experimental data on the primate cerebral cortex.