Generative Modeling for EEG Classification via Signal Filtering

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Project description

1. **Title**: "Generative Modeling for EEG Classification via Signal Filtering"
2. **Problem**: solve an EEG classification task.
3. **Data**: EEG datasets from MOABB library.
4. **Base solution**: Riemannian-based kernel approach by A. Barachant.
5. **Proposed solution**: solve the task by using a decision-rejection strategy. First, we learn two probabilistic models for known ($p(\mathbf{X}|\boldsymbol{\theta})$) and new ($q(\mathbf{Y}|\boldsymbol{\phi})$) data. Then, we measure the distance of these distributions and reject patterns from $q(\mathbf{Y}|\boldsymbol{\phi})$ that don't belong to expected patterns in $p(\mathbf{X}|\boldsymbol{\theta})$.
6. **Novelty**: the proposed solution is universal, it doesn't depend on specific class of EEG data (Motor Imagery, SSVEP, P300, etc.) because we represent the data as probability distributions.