Biophysics 298: Journal Club - Statistical Activations in fMRI
Spring Semester 2004
Daniel B. Rowe, Ph.D.

Course based on lectures. Recommended text.

I will lecture for the first few classes and occasionally thereafter.
Every student must select a paper to present in class and make copies.
Papers must be selected by the second week of class and submitted to me.
I will arrange student presentations in a logical order.
Topics may include statistical experimental design, fMRI time course modeling, fMRI activation level computing, and fMRI activation thresholding.

January
07 Rowe: Statistics Lecture
14 Rowe: Statistics Lecture
21 Rowe: Statistics Lecture
28 Rowe: Statistics Lecture

February
04 Rowe: Statistics Lecture
11 Rowe: Statistics Lecture
18 Peter Kufahl: Razavi et al.: Model Assessment and Model Building in fMRI. Hum Brain Mapp 20:227238(2003)

March

April
07 Rowe: Bayesian Statistics Lecture
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<tbody>
<tr>
<td>14</td>
<td>Rowe: Bayesian Statistics Lecture</td>
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<td>May 05</td>
<td>Kufahl: Statistics Discussion</td>
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<td>12</td>
<td>Bennett: Statistics Discussion</td>
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<td>19</td>
<td>No Class-ISM RM</td>
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**Grading System:** Attendance and Participation.
FMRI Statistical Analysis

1. Statistical distributions
   - Normal
   - Scalar Wishart or Gamma
   - Student-t
   - Multivariate Normal
   - Wishart
   - Multivariate Student-t

2. Univariate Normal Samples
   - Estimating the Mean
   - Estimating the Variance
   - Distribution of Est. Mean
   - Distribution of Est. Variance
   - Confidence intervals
   - Hypothesis tests
   - Vector/Matrix Formulation

3. Univariate Regression: Simple
   - Estimating Coefficients
   - Estimating the Variance
   - Distribution of Est. Coefficients
   - Distribution of Est. Variance
   - Confidence intervals
   - Hypothesis tests
   - Vector/Matrix Formulation

4. Univariate Regression: Multiple
   - Vector/Matrix formulation
   - Estimating Coefficients
   - Estimating the Variance
   - Distribution of Est. Coefficients
   - Distribution of Est. Variance
   - Confidence intervals
   - Hypothesis tests
5. Multivariate Regression: Multiple

- Vector/Matrix formulation
- Estimating Coefficients
- Estimating the Variance
- Distribution of Est. Coefficients
- Distribution of Est. CoVariance Matrix
- Confidence intervals
- Hypothesis tests