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| 1 | Project Title | **Applications of wavelets in statistics**  |
| 2 | Category | Statistics |
| 3 | Level  | 4  |
| 4 | Semesters (length of project) | 2  |
| 5 | Description | Wavelets offer an important new approach to smoothing of noisy data. The idea of wavelet smoothing is to shrink the discrete wavelet transform values that fall below a threshold, then apply the inverse transform. Programs are available in Matlab and R for wavelet transforms, but some programming may be required to implement certain thresholding schemes. This project will begin with the basics of wavelets, multiresolution analysis, and the fast discrete wavelet transform. It will be important to understand why wavelet thresholding works and how to choose the threshold. Two applications of wavelet smoothing will be studied, namely nonparametric regression and density estimation. These will be applied to both simulated and real data.  |
| 6 | References | Brani Vidakovic. Statistical modeling by wavelets  |
| 7 | Prerequisite courses | Statistical Methods | Practical Statistics | Statistical Computing |
| 8 | Additional notes | Programming in Matlab or R is required.  |

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