1046-92-1726   **Deena M Hannoun*** (`hannoudm@jmu.edu`), 1726 Three Springs Rd., McGaheysville, VA 22840, and **Joseph Schutte**, **Anthony Tongen** and **Corey Cleland**. *A Mathematical Model for the Nociceptive Withdrawal Response of Rats.*

In this project, we elicit a nociceptive withdrawal response from a rat through experimental means. The rat's response is captured by two perpendicular high-speed video cameras. We then use a direct linear transformation to transform the video data into three-dimensional global coordinates. The transformed data is used to create a three-dimensional trajectory of the nociceptive withdrawal response and determine the direction of the response with respect to the rat's coordinate system. After determining this trajectory, we use Newton's Law to fit a coupled system of ten ordinary differential equations that describe spring and mass motion to the tail's motion by adjusting the system's parameters. The goal of this project is to use the coupled system of ordinary differential equations to predict the direction of the rat's nociceptive withdrawal response and to determine the forces generated by the tail during the nociceptive withdrawal response. (Received September 16, 2008)