HUMAN EFFECTIVENESS DIRECTORATE

REPPERGER RESEARCH INTERN PROGRAM

RESEARCH PROJECT: 13-23

UNDERSTANDING & PREDICTING HUMAN-CENTRIC THREATS FOR INTELLIGENCE, SURVEILLANCE & RECONNAISSANCE APPLICATIONS

PROJECT SYNOPSIS: This project will focus on providing actionable information concerning human borne threats on the basis of human size, shape and motion. Such signatures as gait, anthroprometric differences, and the presence of a carried object are of interest. The program contains many areas of research including traditional gait analysis, computer vision techniques, engineering optimization, and signals processing. Projects will be assigned on the basis of current need and fit within the larger program and may include conducting experiments in a motion capture laboratory, conducting software development, and building models of realistic human activity. Interns may process raw data, develop or implement computer vision or machine intelligent algorithms, design new laboratory capabilities, or assist in the development of new signatures through statistical analysis, pattern recognition, or first principles models. Interns would work on a team with several doctorate level researchers to provide novel capabilities that augment current research efforts.

EDUCATION LEVEL / DISCIPLINE NEEDED: Master's or PhD student in one of the following: Computer Science; Mechanical Engineering; Biomedical Engineering; Operations Research; Electrical Engineering; Mathematics or Industrial Engineering

RESEARCH LOCATION: Human-Centered Intelligence, Surveillance and Reconnaissance Division
Wright-Patterson AFB, Dayton OH

RESEARCH ADVISER: Darrell Lochtefeld

DEGREE: PhD, Engineering (Operations Research), Wright State University, 2011

Dr. Lochtefeld studied machine learning techniques used in solving pattern recognition problems and difficult optimization problems. His doctorate decomposed problems in novel ways and then solved those problems using Multi-objective Evolutionary Algorithms - methods modeled after Darwin's survival of the fittest. Dr. Lochtefeld currently oversees a broad set of research using human size, shape, and motion to track, identify, and characterize humans observed from aerial platforms. From an applied perspective, Dr. Lochtefeld is interested in computer vision, human movement science, human modeling in software, and large scale data analysis, pattern recognition, and machine learning.

NOTE TO APPLICANTS: If selected for participation in this program, you will be offered temporary summer employment through a contract to perform work for AFRL's Human Effectiveness Directorate. This is not a U.S Government position. If selected, you will be required to undergo a National Agency Check before being granted access to government computer systems.