

# ARETÉ SUMMER INTERNSHIP PROGRAM

Areté Associates, an employee owned company (ESOP), is an advanced science and engineering company contributing to national security objectives. We are a nationally recognized R&D firm known for quality and innovative solutions, specializing in remote sensing applications including electro-optics and radar. Areté seeks individuals to perform challenging technical work in the areas of sensor design and analysis, phenomenology, detection algorithms, atmospheric, oceanography, and related software development.

We are currently seeking outstanding applicants for our Summer Internship Program in our Northridge, California office.

Ideal candidates will have the following qualifications:

Junior, senior, first or second year graduate student

Major in physics, math, engineering, computer science, or related field

Programming experience in C, C++, IDL, Matlab, or Fortran preferred

10 week paid internship program: June 20 – August 26, 2011 / 40 hour workweek

Work in areas of remote sensing, signal processing, physics-based modeling, and data analysis

Applications accepted online - [www.arete.com](http://www.arete.com) - U.S. Citizenship Required

An application consists of a resume, unofficial transcript, and a completed application form.

**Application deadline: March 1, 2011**

**Points of contact:**

Jenny Howell, Human Resources  
(818) 885 – 2255

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(818) 885 – 2295

**Arete Associates  
9301 Corbin Ave Suite 2000  
Northridge, CA 91324**

U.S. citizenship, drug test, & security interview required to meet position eligibility

Areté Associates is an Equal Opportunity Employer and encourages applications from females, minorities, older persons, persons with disabilities and veterans.

# Summer 2010 Internship Project Descriptions

The following are project descriptions from last summer. Project information for Summer 2011 will be made available online on **February 1, 2011**.

## **Project: 2010A**

Category: Radar Resolution Enhancement

Implement a simple variant of a current optical algorithm, taking data from the company's radar image processor code as input. Study radar physics and noise properties, refining the algorithm to make it more appropriate for radar. Prior experience with radar is not assumed or required. Ideally, candidates would:

- (1) Be familiar with Fourier transforms in two dimensions, both continuous and discrete, with convolution theory, and with basic statistics,
- (2) be competent programmers, ideally in C or C++, and
- (3) have a good general math and physics or engineering background.

## **Project: 2010B**

Category: Image Processing

Research and refine an algorithm for performing real-time focal plane registration of visible-band images via exploitation of advanced discrete Fourier transform (DFT) techniques. Evaluate the algorithm using simulated/real data, identify the phase space over which it is applicable, and compare its registration power to other registration algorithms. Programming Language: C or IDL. Understanding of DFTs and experience with FFT algorithms highly desired.

## **Project: 2010C**

Category: Tracking

Modern tracking often needs to be performed in urban areas such as cities and towns. Given the position of the sensor certain areas of the scene will be in shadow and other areas will have no visibility due to line of sight issues. In these situations an understanding of the instantaneous field of view of the sensor can be very useful. Image enhancement can be selectively performed in shadowed areas and tracking algorithms can use line of sight information to increase their ability to follow targets. The goal of this internship is to produce obscuration maps from given urban elevation models and an arbitrary sensor location. The outputs will include line of sight information including both shadowing and blocked view. If time allows, algorithmic speedups and other advancements will be investigated. Programming experience desired; experience with graphics programming or graphics processing useful.