# Position Description

**Job Title:** Systems Engineer, Algorithms – Currency and Secure Documents

**Reports To:** Senior Manager, Software Engineering

***Position Summary:***

The Principal Systems Engineer, Algorithms develops image processing algorithms for complex sensor systems for use in various applications. The algorithms detect and measure specific image features from 2-D monochrome, color, and/or hyper-spectral images. The Systems Engineer, Algorithms solves complex algorithm development problems. The Systems Engineer, Algorithms provides technical and administrative direction for personnel performing software development tasks, including the review of work products for correctness, adherence to the design concept and to user standards, and for progress in accordance with schedules.

The Systems Engineer, Algorithms has a strong understanding of the interplay between algorithms, hardware limitations, and real-world data.  Mastery of algorithms includes digital signal processing techniques, image processing, computer vision, and pattern recognition algorithms.  The Systems Engineer, Algorithms should have practical experience of measuring algorithm performance with real world data and hardware, with considerations for fixed and floating point implementations and limitations for efficient implementation in hardware.

The Systems Engineer, Algorithms has a strong understanding of efficient use of data structures. Mastery of algorithm design criteria including divide and conquer techniques, path-finding, greedy decision making, linear programming based optimization techniques, and practical concerns such as the relationship between data modeling and an algorithm performance and correctness.

The Systems Engineer, Algorithms possesses an advanced understanding of algorithmic methods for processing signals to achieve highly efficient code implementations.  An important aspect of the position is to reconcile real-world observations with analytic predictions or simulation models. These models are used to create algorithms that effectively deal with real-world non-idealities.  Many times development is done by gathering real sensor data and using that data as input for simulations of candidate algorithms.  When acceptable algorithms are found, those algorithms are optimized for implementation in an embedded processor.

 The Systems Engineer, Algorithms will work closely with the members of a multi-disciplinary engineering team throughout the development process, from supporting initial proposals and feasibility studies through algorithm development, implementation, validation, and system deployment.

***Key Skills:***

* Strong critical thinking and problem-solving skills
* Experience developing complex algorithms from concept through implementation
* Experience applying signal processing techniques to detect/measure features in 2-D images and other signals
* Expert level experience using Matlab or equivalent environment
* Strong interpersonal skills
* Excellent writing skills
* Experience using Microsoft Word, Excel, and Visio
* Ability to handle multiple simultaneous tasks

***Roles & Responsibilities:***

* Develop algorithms that meet the customer acceptance criteria
* Develop algorithms working with your DSP counterpart to ensure Matlab and DSP implementations are in agreement
* Develop algorithms with a bias towards using fixed-point DSP implementations
* Submit weekly status reports highlighting status against schedule, obstacles, and risk mitigation strategy
* Develop and execute prototype test plans
* Create aggressive yet achievable project schedule for assigned tasks
* Partner with field personnel on resolution of customer issues
* Own the overall customer solution, so that the task is complete only when the algorithm is developed, implemented and delivered to the customer on time and in specification in partnership with the DSP, ARM, and hardware implementation teams
* Assess project risks and identify mitigation strategies
* Participate in developing/enhancing software engineering processes