



## **ANALYTICS, MODELING & SIMULATION SCIENTIST/ENGINEER: BEHAVIOR CLASSIFICATION & PATTERN RECOGNITION**

### **Boston • DC • Dayton**

**NOTE: Preference will be given to those candidates who can be located in Aptima's DC or Dayton office locations.**

Aptima, Inc. is a fast-paced, employee-focused small business that specializes in finding solutions to complex problems in human-centered engineering. We currently have openings for passionate, creative scientists/engineers of all levels of experience who specialize in mathematical modeling, optimization, and simulation. The hiring team employs computational methods to maximize organizational effectiveness, identify patterns in noisy data, and understand/design organizational, cultural, and social behavior. The ideal candidate will possess strong skills in problem analysis, mathematical formulation, algorithm development, and model implementation and analysis.

Technical responsibilities include designing, developing and enhancing modeling algorithms, implementing them in software, and applying them in analyses. The position entails substantial collaboration with software engineering staff to develop model-based decision support software. Additional responsibilities include business development, proposal writing, project management, and customer interaction.

Minimum Requirements:

- Ph.D. or Masters in an applied mathematical modeling discipline (e.g., Electrical and Systems Engineering, Applied Mathematics, Computer Science, Operations Research). Suitable applicants may range from recent masters graduates through established mid-career professionals; expectations, responsibilities, and compensation will be commensurate with experience.
- Experience developing and implementing optimization and probabilistic classification, inference, or control models. The candidate must have understanding of underlying theories and at least 2 years of experience developing solutions using several of the following approaches:
  - Optimization and function approximation algorithms, including gradient and subgradient optimization, auction algorithms, dynamic programming, and sampling models (Markov Chain Monte-Carlo, Importance Sampling, Particle Filters)
  - Stochastic methods, such as genetic algorithms, simulated annealing
  - Efficient space-search algorithms (branch-and-bound, AO\*, multiple shortest path)
  - Bayesian decision theory; Likelihood, Bayesian, and posterior parameter estimation
  - Hidden Markov Models; Conditional Random Fields
  - Neural Networks, Hierarchical Temporal Memory models
  - Non-parametric classification (including clustering methods, decision trees, grammar-based classification)
  - Reinforcement learning (Temporal difference, Q-learning)
  - Observable and Partially Observable Markov Decision Processes using policy and value function approximations and/or finite stochastic controllers
- Experience implementing complex algorithms and models in C++, C#, or Java
- Journal and/or other refereed publications
- Experience writing technical reports and/or proposals
- U.S. Citizenship
- Must be able to obtain Secret security clearance

The ideal candidate will also possess two of the following:

- Knowledge of basic software/data design methods, data structures, and modeling standards
- Software engineering experience or experience collaborating with a software engineering team
- Experience in project management, business development, and/or proposal writing

Aptima will compensate applicants for any travel or relocation expenses to fill this position. All applicants must be willing to work onsite in one of Aptima's office locations, Monday through Friday (no telecommuting or compressed schedules). Qualified candidates should submit a cover letter, resume/vita, and publications list to [aptima\\_personnel@aptima.com](mailto:aptima_personnel@aptima.com).

All applicants selected will be subject to a government security investigation and must meet eligibility requirements for access to classified information.

**EQUAL OPPORTUNITY EMPLOYER M/F, VETS/DISABLED**