



Support Scientist HWRF 3
NOAA Environmental Modeling Center (EMC)
College Park, MD

I.M. Systems Group, Inc. (IMSG- <http://www.imsig.com>), a Federal Government Contractor, is seeking resumes for a Support Scientist to work at NOAA's National Centers for Environmental Prediction's Environmental Modeling Center (EMC) located in College Park, MD. The successful candidate will support the Environmental Modeling Center (EMC) of the National Centers for Environmental Prediction (NCEP) in carrying out research, development and operational support of high-performance, highly parallelized, geospatial data interpolation and processing. This candidate's work will involve developing new techniques for highly-optimized, distributed interpolation and manipulation of numerical weather prediction (NWP) data produced and consumed at extremely rapid rates. Focus will be on advanced hurricane forecast applications using various configurations of NCEP Operational Hurricane Weather and Research (HWRF) model. The candidate must implement the techniques in a way that takes advantage of MPI, OpenMP and other forms of parallelism, and can interact with legacy Fortran and C programs and libraries.

Duties:

Performs the functions of the job in a high-quality, independent and collaborative way, assisting in managing projects, and developing and applying innovative methods for the primary work areas below. The candidate will work with EMC scientists to develop new highly-parallelized interpolation algorithms, and implement them within current and future NWP models and post-processing software, especially for the high-resolution hurricane forecast applications. This work may include:

- Research and development of new or previously known interpolation algorithms, data structures and communication patterns to perform interpolation in EMC models, preprocessing and postprocessing software.
- Implementation of interpolation and communication libraries, or extension of existing libraries in various configurations of NCEP operational HWRF model.
- Modification or replacement of existing non-distributed libraries and algorithms to handle cases where the amount of memory required to represent NWP grids is too large to fit in one compute node.
- Parallelization of algorithms via MPI, OpenMP or other methods (GPU, APU) to handle cases where interpolation is too complex to handle with the resources available within one node.
- Optimization of communication patterns to handle the extremely rapid data input and output rates.

Required Skills:

Education and Experience:

- Ph.D. in Computer Science or Mathematics, or a related field with at least five years of experience in geospatial data interpolation.

Knowledge, Skills and Abilities:

- Advanced knowledge of geospatial data interpolation, especially of gridded or mesh atmospheric, oceanic and geographic data.
- Experience in parallel algorithm development and implementation, including use of shared memory parallelism (especially OpenMP), distributed memory parallelism (especially MPI).
- Demonstrated ability to create and maintain large libraries or programs that implement complex algorithms in a parallelized, efficient manner in C, C++ or Fortran.
- Experience in best code management practices and use of version code management systems.

Desired Skills:

- Familiarity with operational Numerical Weather Prediction and forecasting environment.
- Knowledge of the mathematics and computational theory behind geospatial data interpolation.
- Knowledge of the physical and mathematical basis of geophysical modeling (atmospheric and/or oceanic) and

experience running a Numerical Weather Prediction model.

- Familiarity with the Weather Research and Forecasting (WRF) model; POM or HyCOM ocean models; Earth Systems Modeling Framework (ESMF); and other NCEP libraries and programs.
- Demonstrated skill in communicating effectively with scientists of diverse backgrounds on technical details of the work plan and to present results accurately and clearly in both oral and written form
- Ability to work independently and in the team environment
- Initiative to work on complex problems and solve problems creatively.

To Apply:

Please submit your resume, the contact information for three (3) references, your salary requirements and a cover letter explaining how your qualifications meet the requirements of the position to jobs@img.com with the following subject line: **Support Scientist: HWRF-3.**

IMSG offers an outstanding overall compensation package including health/dental insurance, short term/long term disability insurance, paid-time-off, and a 401(k) plan.

IMSG is an Equal Opportunity Employer and Veteran friendly.