Imageomics Institute Postdoctoral Research Associate

The Tulane University Biodiversity Research Institute (TUBRI) is searching for a Postdoctoral Research Associate to involve in exciting, biology-guided, machine-learning research for two-years. The position is supported by a NSF Harnessing the Data Revolution Institute project entitled, Imageomics: A New Frontier of Biological Information Powered by Knowledge-Guided Machine Learning. This collaborative, multi-institution, multi-investigator project involves biologists and computer scientists who are training machine-learning algorithms to extract phenotypic trait data from images of a variety of types of biological specimens. The learning is aided by structured biological knowledge such as an anatomy ontology and phylogenetic trees. The postdoctoral researcher will contribute to ongoing efforts to extract trait data from images of fish specimens at the under the mentorship of Henry L. Bart Jr, Professor of Ecology and Evolutionary Biology and TUBRI Director, and Yasin Bakış, Senior Manager of Biodiversity Informatics and Data Engineering at TUBRI. The TUBRI postdoc will have opportunities to interact with other biologists, computer scientists, postdocs, and students from the ten other universities and research centers involved in the Imageomics Institute.

TUBRI is a research center of Tulane’s School of Science and Engineering, located on the grounds of the F. Edward Hebert Research Center in Belle Chasse, Louisiana, a suburb of New Orleans. TUBRI houses the Royal D. Suttkus Fish Collection and specializes in biodiversity discovery (primarily involving fishes) and biodiversity informatics research.

The postdoctoral research associate will contribute to all aspects of ongoing work on the Imageomics Institute project at TUBRI, including:

1. Processing images of fish specimens and their supporting metadata to prepare them for machine-learning experiments;
2. Extracting data on morphological traits of fish specimens in images and determining the utility of the extracted data for identifying fish species and quantifying differences in traits of fish specimens from different populations within species;
3. Using extracted morphological traits data in “morphological barcoding” experiments focused on distinguishing images of fish specimens representing various fish taxonomic groups;
4. Verifying data and project output quality and accuracy;
5. Supporting the TUBRI coding team by
   a. assisting with software design where biological expertise is needed,
   b. making sure the software is properly documented,
   c. providing input during the coding process so that outputs are scientifically sound and publishable;
6. Attending project-related workshops, training programs, and meetings;
7. Keeping abreast of the latest literature relevant to the project;
8. Openly sharing findings with project collaborators;
9. Work collaboratively with Imageomics ML experts to explore develop new deep-learning methods;
10. Present analysis results at conferences and publish findings in scientific journals.

Required Knowledge, Skills, and Abilities
Prior (proven) experience in at least one of the following:
Image Analysis, Artificial Intelligence, Genetic Algorithms, Biodiversity Informatics, Computational Biology, Bioinformatics, Biomedical Informatics, Ecoinformatics or a related field (scientific publications)
Working knowledge of at least three of the following languages (one from each group)
{Java, C, C++, C#}, {Python, PHP, Perl}, {R, Bash, JavaScript}, {ORACLE SQL, MSSQL, PostgreSQL, MySQL}
Working knowledge of Unix based operating systems
Experience in writing grant proposals and scientific publications
Strong problem-solving skills

Required Education and/or Experience
PhD in Biological Sciences, Biodiversity Informatics, Computer Science, Information Sciences, Computational Biology/Bioinformatics, or a related field

Preferred Qualifications
Experience with:
Image Processing
Artificial Intelligence/Neural Networks
Genetic Algorithms
Web-database applications
Experience in parallel computing (GPU)
Working knowledge of version control system (GIT)

Other Considerations
The position is open to international candidates
The postdoc is expected to travel internationally
The postdoc should have strong communication and interpersonal skills

Start date: As soon as an acceptable candidate is identified

For additional information about the position, including application instructions, please contact Henry Bart (hbartjr@tulane.edu) or Yasin Bakış (ybakis@tulane.edu)