4 Postdoc and 5 PhD student positions studying structure and function of trees using drone-based remote sensing

The FastPheno project is soliciting applications for several postdoctoral and fully funded grad student positions. This project will combine the next generation of high-throughput drone-based phenotyping platforms, plant ecophysiological and genomics approaches to understand forest dynamics and tree resilience to climate change impacts. The positions are part of a large project with researchers from the University of Toronto, Université Laval, Natural Resources Canada and the Ministère des Forêts, de la Faune et des Parcs du Québec.

We are looking to hire postdocs and grad students with complimentary skills and interests. Successful applicants will work in Toronto or Quebec in an interdisciplinary team of researchers of the four participating organizations in a highly collaborative environment. If you have a background or interest in one or several of the following areas, you should send us your application: Plant biology, ecophysiology and ecology of trees, remote sensing, tree genetics and genomics, data sciences, bioinformatics, and statistical modeling.

Qualifications

I. Postdocs (two positions) remote sensing of vegetation and ecophysiology

The postdoctoral fellows will take leads in the FastPheno project activities on drone-based collection and processing of hyperspectral and LiDAR data from multiple experimental field sites and forest stands located in Quebec and Southern Ontario. Candidates must hold a PhD in remote sensing, plant biology, forestry, or a related field. Strong background in photosynthesis, ecophysiology, leaf traits, remote sensing and big data analysis and experience with machine learning algorithms is required. Experience with retrieval of plant physiological and structural information using hyperspectral or LiDAR information is an advantage.

II. Postdoc (one position) statistical modelling and integration of adaptive traits for genomic selection

The postdoctoral fellow will take leads in the FastPheno project activities on developing and validating the relationship between adaptive traits and drone derived data and refine prediction models of phenology from phenotype trait data. Candidates must hold a PhD in bioinformatics, biostatistics, or a related field. Strong background in advanced bioinformatics, statistical genomics, and model-data integration is required. Experience with plant biology, molecular ecology, genomic selection models and machine learning algorithms is an advantage.

III. Postdoc (one position) integration and visualization of genotype and adaptive trait phenotype data

The postdoctoral fellow will take the leads in the FastPheno project activities aiming to implement a new data browser and visualization tool which integrates genomic resources and drone derived phenotype data. Candidates must hold a PhD in bioinformatics, environmental informatics, computer science or a related field. Strong background in plant biology, database design, data visualization and experience with scripting languages (e.g., Python, Rcran tools, Matlab) is required.

Postdoctoral candidates must have received their PhD after January 2018 Candidates must have strong verbal and written communication skills, willingness to work independently and in a collaborative team environment, and proven capability to publish in peer-review journals.

IV. PhD students (five positions) forest dynamics – growth, canopy structure and ecophysiology

The PhD students will investigate climate adaptation in trees and focus on specific leaf traits. This includes e.g., leaf optical properties, chlorophyll-a fluorescence, and photosynthetic pigments, which will be upscaled to the canopy scale by coupling with drone-derived hyperspectral and LiDAR data. Integration of these data will eventually allow to derive tree level structure and physiology from remote sensing.

PhD candidates must hold an undergraduate or master's degree in plant biology, forestry, or a related field. Experience in one or more of the following areas: Plant physiology, ecophysiology, plant molecular biology, ecology. Experience or an interest in learning programming languages such as Python, Rcran tools or Matlab for the analysis of large data sets is an advantage.

Applications

Potential applicants should send their CV, a list with the names and contact information of 2-3 references and a max. one1 page motivation letter in a single PDF file to **ensmingerlab@utoronto.ca**. Use the words **FastPheno Application** in the subject line of your email followed by the number (**I. to IV.**) of the position you are applying for. The Deadline for submitting your application is October 1, 2021, however, applications will be accepted until the positions are filled.

For questions on individual positions or the overall project please email **ensmingerlab@utoronto.ca**.

For questions and further information about the co-investigators and their research use the following email addresses and visit their websites:

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