

PhD position in bioinformatics/statistical genetics at the University of Grenoble (France) Title: Large-scale statistical methods to study biological adaptation with genome wide dataset

The candidate will be involved in a multidisciplinary research project that concerns a team a mathematical and computational biology in Grenoble and a team of human evolutionary genetics at the Institut Pasteur in Paris. The PhD candidate will work in Grenoble, which is a French university town located in a beautiful alpine environment. Subject: Because of the explosion of large-scale biological data, statistical research efforts are increasingly needed in modern biology. The project concerns the development of statistical methods to study human genetic adaptation. Humans experienced several changes of their environment, which triggered rapid biological adaptation. The shift to agriculture was a prominent modification of their environment. They adopt sedentary lifestyles, resulting in increased population densities and modifications of their pathogenic environment that lead to novel selective pressures. However, the extent and rapidity of the genetic adaptation to such novel environments remain largely unknown. Based on genome wide data (exome sequencing) generated by the Institut Pasteur in Paris, we will investigate the occurrence of rapid adaptation through various evolutionary mechanisms. The candidate will develop original statistical approaches to detect the regions of the genomes that have been involved in genetic adaptation. Statistical models will be based on machine learning approaches that are particularly well suited to handle large-scale genomic data. Numerical implementations of the proposed approaches will be compared based on simulations that mimic evolutionary processes of biological adaptation. Profile: The background of the candidate can be in statistics or bioinformatics. Students from related disciplines, such as physics, computer science, mathematics or computational biology are also welcome to apply. Applicants with a genuine interest for interdisciplinary PhD education will be preferred. Applicants should send by email a CV and a recommendation letter from an academic reference. Contacts: Michael Blum <http://membres-timc.imag.fr/Michael.Blum/>

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