Final report

Name of intern: Kseniia Sholokhova

Home University/Country: Immanuel Kant Baltic Federal University, Kaliningrad, Russia

Subject: Performance evaluation of statistical and machine learning methods in differential abundance analysis of microbiome data.

Guest University/Country: Institute of Medical Informatics and Statistics (IMIS), University Medical Center Schleswig-Holstein, University of Kiel, Germany

Name of supervisor: Arunabh Sharma

Part 1. General information about

1.1 your application (motivation)

My background is in Down Syndrome evolutionary biology and from relevant literature, I found out that the microbiomes of individuals with Down syndrome showed unique characteristics. Hence, I was interested in learning statistical methods of analyzing microbiome data so that I could apply it to my own research. Besides, I am interested in machine learning and data science and wanted to gain hands-on experience in this field.

1.2 your preparation

I am very new to statistical programming. So, Arunabh Sharma provided me with the learning resources before the start of the internship and this helped me a lot. Apart from this, I also got proper training and guidance regarding microbiome science.

1.3 your travel

To get to Kiel, I firstly took a flight from Kaliningrad to Moscow. The next day, I took a flight from Moscow to Frankfurt. From Frankfurt, I took multiple trains to go to Kiel.

Due to the coronavirus situation, I was able to travel only inside Schleswig-Holstein during my internship. In Kiel, I explored the city area. One of my favorite places was Kleiner Kiel, where I liked to spend time after work. Also, I enjoyed the picturesque thoroughfare with marine views - Kiellinie. Apart from Kiel, once I traveled to the city of Lübeck. There I visited the famous Holstentor and old city.

Lübeck at Christmas time.

To get back to Kaliningrad, I took a bus from Kiel to Gdansk. From Gdansk, I got back to Kaliningrad.

1.4 your accommodation

My first accommodation was an Airbnb apartment with personal facilities, where I spent my quarantine period. After having a negative COVID-19 test and reporting to the local health department, I moved out to my main accommodation. Arunabh Sharma and the Institute helped me to find my main accommodation which was the Gästehaus Kiel I (HDP), Hans-Detlev-Prien-Straße 10.

The apartment was well-equipped, warm, and clean with a picturesque view. It has one bed, workspace, private bathroom, and toilet. The kitchen was shared. In the Gästehaus, there was a cafe and laundry room. In the vicinity of Gästehaus, there was a huge grocery store, bakeries, and green area.

Astounding view from my accommodation.

1.5 your life in the host country

My internship took place in Germany. I enjoyed living in Kiel, which is a city with vibrant student life and lots of opportunities. There, I explored the local architecture and a variety of high-quality bioproducts. Besides, I found new friends and never was bored. On the weekend, I liked to take a walk at Andreas-Gayk-Straße and buy my favorite drink - bubble tea. Despite the fact that I don't speak German well, I had no problem with communication with the local people. Everyone was friendly and welcoming to me.

A way to spend a day off in Kiel.

Part 2 Information about the project and your tasks

2.1 Information about the research project (short description of the project and your tasks).

The project was focused on methods concerning statistical analyses of microbiome data. My first task was to find publicly available microbiome datasets and prepare this data for analyses. My second task was to review network-based methods for analyzing microbiome and implement picked ones to the data. My third task was to get quantitative measures from derived networks, so the evaluation of the methods could be performed. At the end of the internship, the project was successfully presented to the colleagues in IMIS.

2.2 your colleagues

My colleagues at IMIS were very helpful, friendly and welcoming. We could not only discuss science but also culture and society. They introduced me to several local foods and customs. During my internship, I participated in the online RTG retreat that helped me to learn more about the projects of colleagues.