

## 工系3学院学生国際交流基金プログラム

## 帰国報告書

## Debrief Report of International Exchange Program operated by Engineering Schools

派遣者氏名 Your Name: <b>Grace Kagho</b>	
所属・研究室・学年 Affiation and Grade: Transdisciplinary Science and Engr. (M2)	
派遣先大学・専攻 Name of Host Institute/ Dept.: ETH Zurich, Institute of Transport Planning & Syst. 受入研究室・教員名 Name of Host Laboratory/ Supervisor: Prof. Kay W. Axhausen	
派遣期間 Period of Study Abroad: 18年10月02日 ~18年12月27日	
申請カテゴリーCategory: <input type="checkbox"/> (C1)SERP <input type="checkbox"/> (C2)AOTULE <input type="checkbox"/> (C3-a)部局間協定校 <input checked="" type="checkbox"/> (C3-b)全学協定校 <input type="checkbox"/> (C4)その他	
研究(プロジェクト)題目: Research Theme <b>Modelling Agent-based Transport Simulation</b>	

## 注意 Notes:

- A) 帰国後1か月以内に工系国際連携室宛 (ko.intl@jim.titech.ac.jp) に**MS Word**ファイルにて提出ください。Please submit the report in Word file within 1 month after returning to Japan.
- B) SERP・AOTULEで派遣された場合は、受入教員の評価書も添付して下さい。Please attach the Evaluation Report written by your host supervisor.
- C) この表紙を含まず、ページ数は2~4ページ、ファイルサイズは3MB以内として下さい。The report has to be 2~4 pages without containing these two cover pages and within 3 MB.
- D) 研究室や宿舎内の様子の写真、図表、イラスト、滞在中のその他の写真などは挿入可です。ただし、それらを掲載する際には簡単な説明を加えて下さい。Please insert pictures and charts with captions.
- E) 提出された報告書を工系のホームページに掲載いたします。また、別途、学内広報誌「東工大クロニクル」の執筆をお願いすることがあります。The report will be posted in the Engineering Schools' website. You may also be requested to contribute a report to Tokyo Tech Chronicle.

## 報告書必須記載事項

1. 派遣大学の概要(所在地、創立年、規模など) Outline of your host university (Location, Time of Founding, Scale of the university)
2. 留学準備など Preparations before your study abroad
3. 所属研究室での研究概要とその経過や成果、課題など Outline of your research and its progress, finding, and challenges for the future
4. 所属研究室内外の活動・体験(日常生活・余暇に行った事など) Activities and experiences beside research (daily life/ leisure)
5. 留学先での住居(寮、ホームステイ等)、申し込み方法、ルームメイトなど Type of Accomodation (dorm/ homestay) and its application method, who were your roommates and etc.
6. 留学費用(渡航費、生活費、住居費、保険料)など Expenses (Flights, Livng cost, Housing/Rooming rent, Premium, Administrative fees, and etc.)
7. 今回の留学から得られたもの、後輩へのメッセージ、感想、意見、要望 Outcomes through the study abroad, Message to juniors, Feedbacks, Opinions, or Requests
8. その他 \*任意 Other \*optional (Trouble, Your Career Path, etc)  
(留学先で困ったこと、帰国後の進路(就職・進学・長期留学)など)

# 東京工業大学 工系3学院学生国際交流基金

## 帰国報告書

派遣年月 **Period of Study Abroad:18年10月~12月**

氏 名 **Name:Grace Kagho**

所 属 **Affiliation at Tokyo Tech:School of Environment and Society,  
Dept. of Transdisciplinary Science and Engineering**

派遣先 **Host University:ETH Zurich**

The Swiss Federal Institute of Technology, Zurich popularly known as ETH Zurich is one of the leading university in Switzerland and ranked in the 11<sup>th</sup> place in the world university 2018/2019 ranking by Times Higher Education. It was founded in 1855 to serve as a driving force behind Swiss industry and since then the university have succeeded in gathering and training talented people which as a result have enabled them to produce 21 Nobel Prize winners.

The number of students is approximately 18 thousand with international students accounting for approximately 38%. ETH Zurich is famous worldwide not only for its ranking as one of the top universities in the world but also because Einstein spent some time teaching there. (Einstein's locker is on showcase there).

Before going to ETH Zurich, I made some preparations and sort information regarding, accommodation, weather during my stay, Zurich transportation system, and standard of living. I was lucky to have met an ETH Zurich student who were doing and exchanged program at Tokyo Tech. They assisted in helping with finding a suitable accommodation at a fair price of 600 CHF (Approx. 66,000 yen) which is quite cheap for the room size and the facilities. Living expenses is quite expensive in Zurich, however I learnt that if one prepares their own meals most of the time and rents a bicycle for moving around, one can live within the same living standards as Tokyo.

I visited ETH Zurich as a visiting researcher to the Institute of Transport Planning and Systems under Prof. Kay. W Axhausen's research group. My research was focused on modelling an agent-based transport simulation (MATSim) scenario for Lagos, Nigeria. The objective was to show to apply MATSim to Lagos Household Travel Survey data to show a microscopic model of traffic flow in Lagos State. Upon my arrival I was introduced to members working with MATSim who were ready to guide and support me throughout my research experience at ETH. I was allowed to sit in for an ETH class on Agent Based Transport Modelling.

The research process was in two phases, first phase involved understanding the tools and using sample data to test for proper understanding. In the second phase, I worked with Lagos household survey data which I spent time cleaning and then prepared the necessary input data for MATSim. I was able to utilize already existing methods and programming modules already developed in the group. The result of the simulation can be seen in the map figure of Lagos. The blue and arrows represent vehicles on the road network and the red areas represent congested routes.

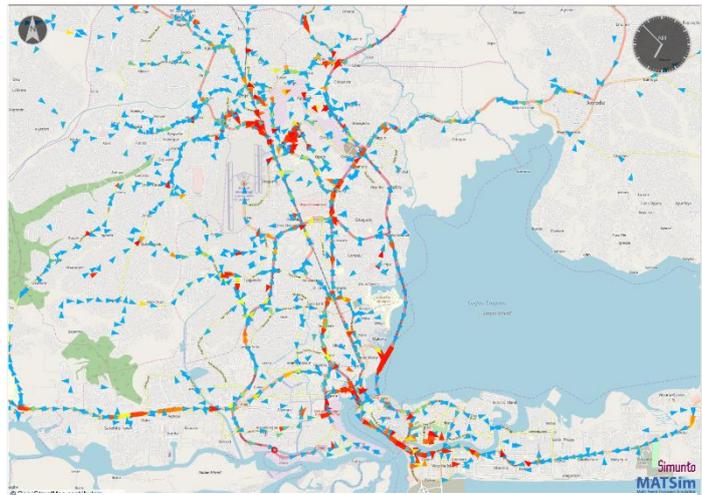


Fig 1: Final Research Results: A simulation of Lagos Traffic

Further analysis was then carried for traffic count validation and travel time accessibility calculations. The last two weeks of my research time was spent on writing a working paper about my results. Given the amount of time available for the research, the purpose of the visiting research was met and expanded to reveal further improvement and future work necessary to achieve better results. This involves expanding the baseline traffic scenario for Lagos to include a more detailed public transport network because at the present stage of the traffic scenario generated, public transportation is not fully modelled as para-transit which has a 46% modal share in Lagos is not properly simulated. Furthermore, is to include freight to the network and model the whole population of Lagos using population synthesis to create synthetic persons representing every person living in Lagos.

Beyond research work, I had a wonderful time at the ETH Honggerberg campus where my research group is located. The members of my research group are amazing people, very supportive and contributed a great deal to help me in achieving my research objectives. Lunch time was a great opportunity to know more about them as the group members mostly ate lunch together at the Honggerberg campus cafeteria. On some days when the Prof. Axhausen is around, he would join us. We also had brown bag seminars biweekly where we all ate sandwiches prepared by the institute while listening to one student in the group present about their research.

I used some weekends to visit recommended sites in Zurich as well as go to the Christmas market in Germany. With a Schengen visa or a Swiss professional visa (which I had) one can visit countries in the European union. I also spent Thursday evening at the Thirstday Bar, a student organized bar at the CHN Building in ETH Zentrum campus. This way I could interact with some of the students freely and participate in some activities organized there such as candle making.

For my accommodation and expenses as have been mentioned above, I was lucky to find a shared flat in a central area before arriving in Zurich. My living expenses were always below 400 CHF per month as I prepared most of my meals myself and ate a few times at the campus cafeteria. I used a bike to commute to the nearest ETH campus and took the ETH free link bus to Honggerberg. This was until it became too cold to use a bike and I had to buy a monthly Zurich pass for about 80 CHF. This allowed me to use the trams, buses or trains within the Zurich city zone and for my commute.

In conclusion, my study abroad experience at ETH met more than my expectations and

afforded me an opportunity to learn from great minds in the field of my interest. I also learnt a lot about the Swiss culture, was able to expand my network and develop relationships with interesting people. My message to those interested in study abroad is that, it is a great opportunity to expand your view of the world, meet interesting people, and learn new things from diverse perspectives. So if you have even a tiny chance to study abroad, do it.

Here are a few pictures to share my experiences.



Fig 2: Lunch with research group members and Brown Bag Seminar



Fig 3 Snapshots of ETH Honggerberg campus

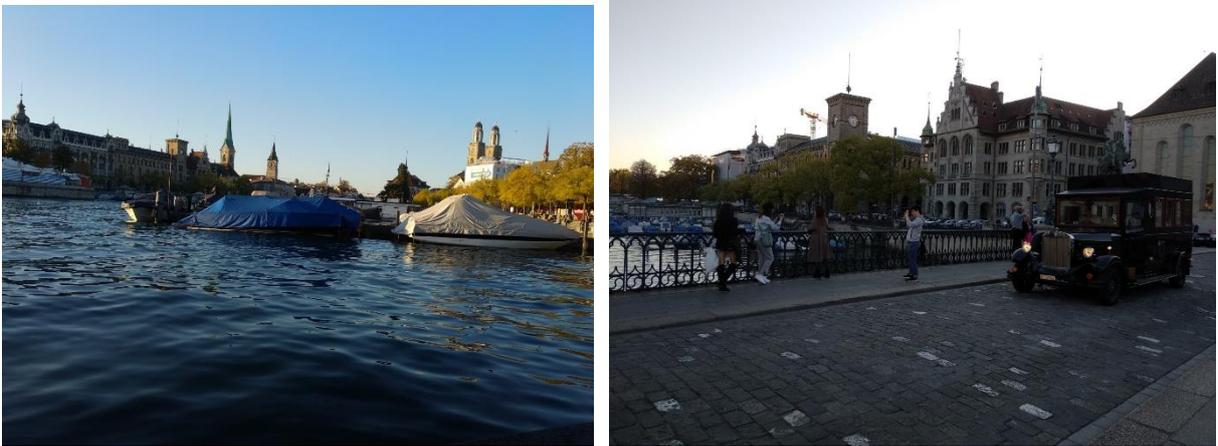


Fig 3: Sightseeing in Zurich