



**CHUST – Chemical U.S. Travels**



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## *Travel Story 201X*

**Name:** Markus Ekvall

**Year and line of study at KTH:** My fifth year in *Medical biotechnology*

**Which university did you visit? (Name, city, state)**

Stanford, Palo Alto, California

Time frame: 2.5 months

Visa type: J1

Insurance: IMG

Scholarship: None

**Please write about your travel, internship and time in the U.S. by answering the questions below as detailed as possible, in 1-2 pages. You may answer in Swedish or English.**

### Project description

The project was to fine-tune a ridge regression model (one of the more primal machine learning models) by changing/optimizing certain aspects of the algorithm. The performance of the modification was analyzed by creating something called “The learning curve”, where the prediction error is plotted against the amount of data used. So the more concrete aim was to decrease the prediction error, while decreasing the amount of data used to obtain an accurate model.

In order to reach the main goal, I was given some smaller tasks such as fix different ways to scale the data e.g. standardization and normalization. This was rather easy fix, but a good starting task for a beginner. Here I learned how to program in Python properly and write the code in a structured and smooth way, making it easily accessible for others.

Another memorable task was to fix a bug in their validation model. This bug forced them to use a relative slow validation method which was very costly. This ended up to be a very daunting task, because in the end it appeared not be an actual bug in the code. The problem was that some of the datasets were badly conditioned and therefore some of the operations used in the model generated faulty results. After a lot of research and repetition of my linear algebra I found a way to fix it by some algebraic manipulation. This ended up to be the most exciting task because it was no guarantee that I would fix it. I could easily have spent the whole second half of my stay on this problem without a final solution, but I finally solved it, which made me and my supervisor very happy.

In the end, with some great guidance from my supervisor, I managed to reach my goal of optimizing their ridge regression model.

### Campus life

There were quite a lot of people on the campus, even though it was summer. But I felt like most of the people were tourists or newly accepted undergraduate students with their parents.

Palo Alto has a centrum which is quite small, but has all the necessities needed, such as restaurants, stores, and bars. The nightlife was good, and the people I met were very enjoyable.

San Francisco is very close to Stanford, only 1 hour with the Caltrain, which can be found nearby the Stanford shopping mall. San Francisco has a lot of cool stuff to see such as the Golden Gate, Fishermen pier, and little Italy.

Even though the bus is free within the campus, I strongly recommend buying a bike. It makes things a lot more convenient and decrease the commute time.

The cheapest flight from Stockholm to Stanford is with Norwegian via Oakland. Flights can be found on their homepage. There is about 1 hour with Uber/taxi from Oakland to Stanford, with a cost of approximately \$100.

They have free gym at SLAC (the linear accelerator outside campus). It goes a bus from campus the whole way to SLAC. You will need a badge to enter the SLAC-area, which you probably can get via your supervisor.

### Application

It's extremely important to start the VISA process as soon as you have been accepted by your host. The time difference will give you on average one email per day which you can communicate with their administration. In general, in the US, you will need to fill a lot of paper, which takes time. Time will become very important under these processes, so start the process early!

Ensure yourself that you will have evidence for your bachelor degree. It seemed to very important at this institution.

They also were very keen with that you were insured. First I bought *If* insurance, but unfortunately it did not state that I was insured for the terms that Stanford required. So I had to buy a second insurance from IMG. But Stanford has a couple of other insurance's that they recommend that fulfills all of the requirements.