American Friends of Arts & Metiers ParisTech
Attn: Benhamou Global Ventures, LLC
540 Cowper Street, Suite 200
Palo Alto, CA 94301-18069

Dear American Friends of Arts & Metiers ParisTech,

I hereby, Grimich Karim, give my full authorization to publish the content of this letter on your website in recognessence of the financial support that you have provided me with.

Full Name: Grimich Karim Date: August 6, 2010

Signature: Grimich Karim

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1. Name of student, background, professional aspirations (1 paragraph, 5 lines)

My name is Karim Grimich. I'm a student from Arts et Metiers ParisTech. Before going to Arts et Metiers ParisTech I studied in French "classe préparatoire" in the mathematics and physics class of the Lycée Chaptal. This year, instead of doing my third year at Arts et Metiers ParisTech, I was a student of a master's degree program. This master's program is in collaboration with other leading French engineering schools and I studied fluid dynamics in it. As for my professional aspirations I'd like to work in the energetic field or in aerospace.

2. Please tell us how you were able to get your internship, and the date and length of your stay (1 paragraph, 5 lines)

I did my internship in the University of California Davis in the department of mechanical and aerospace engineering. I was selected to do this internship by Mr Lerat, a professor from my master. He proposed internships on the first day of my Master. This internship was my first choice and I was selected thanks to my good ranking in the school, 60th in 1025 students. It was a four months internship from the 23rd of March to the 23rd of July and I stayed in the US from the 15th of March to the 31rd of July.

3. Please present the company or university where you interned and the objectives of your internship (1 paragraph, 10 lines), and why you were excited to work there. (1 paragraph, 10 lines)

The University of California Davis (UCD) is a public research university. It's located in Davis, California. I did my internship in the Mechanical and Aerospace Engineering department (MAE) of the UCD. The MAE is a large and thriving department with 34 full-time faculties, 640 undergraduates students, 140 graduates students and $10M annual research funding. I had to work on a device called the Rtube. This device is used in Exhaled Breath Condensate (EBC) analysis. EBC analysis is a non-invasive and inexpensive method to diagnostic diseases. For instance, it consists in sampling breath for non-invasive assessments of airway chemistry or inflammation. EBC contains lot of volatile or non volatile components in which are biomarkers that could reveal an illness. This is why the aim of my internship was to known if the EBC collected in an RTube could characterize the breath getting out of the mouth of a patient. This way I had to study the flow field and the heat transfer in the Rtube. The objective was to relate these studies to the condensation rate in the Rtube in order to express that in term of condensate collected.

I was really excited to work there for several reasons. The first motivation for me to choose this internship was the subject. It's a really concrete subject of research. On the first sight it could only seems to be a subject of research only with lot of numerical simulations to do : flow fields, heat transfer and impact of them on the condensation in a specific geometry device. But all the assertions and the results of this internship will help to really understand what is affecting the sampling results. Besides it will help to design devices where all the effect emphasizes by the study will be controlled. Another motivation was the English language. I tried to work hard on my English at school or alone for a long time. So this internship represented also an opportunity for me to practice and strengthen my skills in English because it was my first time in an English spoken country. Moreover I wanted to discover another culture with other ways of thinking and of working. I also wanted to show, in my own proportion, what someone with a formation at Arts et Métiers ParisTech could bring in the US and how it could be complementary to some way of working from here.

4. Please tell us which expenses which will be covered by the funds provided by American Friends of Arts et Metiers (1 paragraph, 5 lines)

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The funds provided by American Friends of Arts et Métiers will cover my rents in Davis. I was living in an apartment with a student of UCD. The initial rent was $1300 per month. Since it was a sub leasing we had the apartment for $1000 per month. So I had to pay $2225 for four month and a half without the utilities. This was the cheapest leas that I found at this moment of the year because nobody was leaving any apartment in the middle of March. I think that with the utilities the €2000 funds of AFAM correspond to my rents.

5. Please summarize your internship, how you achieved the company/university's objectives (1 paragraph, 5 lines), as well as your own personal goals and lessons from this experience (1 paragraph, 5 lines), and finally how this impacted your professional aspirations (1 paragraph, 5 lines).

Before beginning my internship I had to install an open source software, OpenFoam, on my personal account without any administrator privileges because of the budget cuts of the UC. Then I had to do the same for a mesher. The first objectives of my advisor were to do the study, flow fields and heat transfer in the Rtube, with a simple geometry after the validation of the software on known cases. I did all the validations and the study then I meshed a complex geometry which is closer to the real geometry. I finally studied the impact of the use of the real geometry on the heat transfer.

My first goal was to finish my study. This is why I worked really hard to finish it and the results of my study might be published in a medical journal of research after redaction of the article. I also learned a lot about Unix while I was doing all my installations. And in this internship nothing worked at the first place, I even had a period of three weeks without a result. So I have the feeling that I showed to myself how I can surpass myself in front of big difficulties. Finally I was the first one to use this software in the team of research of my advisor and I enjoyed helping other people from the team when they began using it.

Before doing my year of Master I was interested by research but I didn't know what it really was. This is one of the reasons why I did a master research. And my internship confirmed the fact that I want to work in research in my opinion. This happened because it strengthened the idea that I had from it. For me, working in research is working hard on really complex scientific questions and in the case that we found something having a great feeling of getting forward. I know that working in research is hard and difficult but I enjoy the idea of making the science progressing.