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DAAD RISE supervisor in summer 2017

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In the second year of my quest towards a PhD degree, a colleague forwarded an e-mail from the DAAD RISE program. It was the reminder e-mail that the application phase will end in two weeks. Usually, I don't like working on such a tight schedule; however, I just drafted a project for a B.Sc. student, that has not been filled yet, which seemed to be a good fit. Within the DAAD RISE database, there were only a very limited number of projects from Universities of Applied Sciences. This came to me as a surprise because their focus on applied projects should be an appealing reason for offering internship positions. I prepared an internship offer including information about the project and our research group and uploaded it to the database.

One part of my PhD project aims at applying photoplethysmography imaging (PPGi) methods in the context of ultra-high-field (UHF) magnetic resonance imaging (MRI). Our motivation is to use this technique instead of commonly-used, contact-based techniques (e.g. electrocardiography) that are biased by noise at UHF. PPGi allows to estimate the cardiac activity from subtle skin color variations captured with a video camera. Recently, it has been shown PPGi signal strength can be increased by applying contact force to the skin, e.g. through contact with a glass plate. With the DAAD project I aimed, at investigating this effect rigorously by means of an experimental study. In simple terms, I wanted to record the sole of the skin and the palm of the hand with a camera through a glass plate and to estimate the heart pulse from the acquired video.

After some month of waiting, sixteen applicants with many having excellent grades and first research experience applied to my project proposal. Of course, I was motivated by the high number of applications but their promising resumes with many candidates having a plethora of awards and honors made the ranking a tough decision. After a short time of waiting, I was excited to learn that the DAAD funded our project proposal and arranged the contact with the first candidate on our list. Unfortunately, he canceled shortly after due to personal issues. Luckily, the DAAD was very supportive in this complicated time and allowed us to nominate the second from the list which was Tyler from Texas A&M University. Despite the spontaneous offer and the fact that he was spending the current semester studying in Wales, he was very motivated to join our lab. We quickly filled the (minimal) paperwork for the DAAD and I sent him some literature to prepare for the project.

Subsequently, the most stressful task of the whole DAAD project started: Organizing a furnished room for an adequate price at an adequate distance to our faculty. After many discouraging e-mails and phone calls I finally received an offer from a student dormitory administrated by the catholic church, that I luckily accepted. I suggest every potential DAAD RISE supervisor to check if there is a contact person at his/her institution for organizing student housing. If not, be prepared to spend a considerable time for this task.

However, when Tyler arrived, everything was set up and during his stay, Tyler exceeded my expectations by far: At the beginning, I provided him construction material and hardware (industrial camera, custom-built illumination, commercial

pulse oximeter, Arduino microcontroller) for an experimental set-up. Despite the wide spectrum of tasks involved (Planning and building of a setup requiring a certain amount craftsmanship, C++ programming for hardware communication, MATLAB programming for data analysis), he performed all the tasks I gave him thoroughly and rapidly. Furthermore, his efficiency allowed us to perform a study with 21 volunteering students within his stay. Next to his research capabilities, Tyler was a great enrichment to our lab due to his friendly nature and he joined us in many extramural activities.

After his stay, despite him finishing his undergraduate studies during this time, Tyler and I continued working on the acquired data which culminated in a conference paper, which we presented in a talk at the IEEE International Symposium on Medical Measurements and Applications [1]. Additionally, I wrote him a letter of recommendation describing our project. Today, Tyler is admitted to a PhD program in computational biology at the prestigious Carnegie Mellon University and I hope that the experience gained during his DAAD RISE stay and my letter of recommendation were of some use in his application process.

Viewed with some distance, the DAAD RISE project was a very valuable experience for me. Next to the achieved results for my PhD project, I started learning how to instruct and enable a person to achieve a well-defined goal. Recently, I started being the project lead in a third party funded project, and in this context this skill has proven very useful.

In autumn 2017 I was at a PhD symposium and met Dr. Christian Schäfer from the DAAD, who initiated the DAAD RISE project some years ago. I thanked him for this great opportunity and hope that there will be many other successful DAAD RISE projects in the future.

[1] http://dx.doi.org/10.1109/MeMeA.2018.8438656