Trainee Report

INTERNSHIP AT SIRENA TECHNOLOGIES

BANGALORE, INDIA

My 9 week industrial internship at Sirena Technologies Private Limited in Bangalore, India, lasted from 28th of October till 28th of December 2016. The internship was organised by *IAESTE* (*International Association for the Exchange of Students for Technical Experience)*. Beside the improvement of my professional skills in the field of electrical engineering I hoped that this internship also would give me the possibility to get in touch with the Indian culture and people.

To anticipate it right at this point: the time in India has completely fulfilled all my expectations and I highly recommend it to anyone to go abroad for an internship.

PREPARATION

Application process: The placement of this internship was made by *IAESTE*. All informations about the application process including the application deadlines can be found on the homepage of the corresponding *IAESTE* local committee of your city. *IAESTE* is an independent, non-profit and non-political student exchange organisation, that provides students in technical degrees with paid training abroad. *IAESTE* — founded in January 1948 at Imperial College, London — is with over 80 countries involved and exchanging over 4000 traineeships each year worldwide the largest organisation of its kind in the world.

Visa: A valid visa is required for all foreign nationals in order to enter India. In Germany Indian consulates can be found in the following four cities: Hamburg, Berlin, Frankfurt and Munich. The official homepages deliver you with all necessary informations about the required documents for the visa application. A bit more difficult is the selection of the right visa for your upcoming stay in India. In the case, that your internship will take place in an university or educational organisation, ask the university to send you an letter of admission and apply for a student visa. In my case — as my internship took place in a company — I applied for a X-Entry visa, that was slightly more expensive than the student visa (cost: 110,50 €). The online application form that has to be filled out and submitted with all other required documents can be found on the following homepage hosted by the government of India (*https://indianvisaonline.gov.in/*). Once all required documents reached the consulate the visa process will take one to four weeks. The time can vary from case to case, this is why I would recommend to apply for the visa as early as possible.

Flight: As long as the visa is in place, the flight can be booked. A lot of money can be saved by booking the tickets in advance. For the destination of Bangalore International Airport (Bengaluru Airport) a whole bunch of good connections from Germany are available. Make sure that the dates of your flights match with the validity of your visa.

Vaccination: A huge amount of partially contradictory information about recommended vaccinations are available on the internet. For reliable information I can recommend the information provided by the *Bernhard-Nocht-Institut für Tropenmedizin* (*https://www.bnitm.de/*). At least two months before the scheduled departure an appointment with a doctor should be arranged. Depending on your health insurance a part or even the complete costs for the vaccinations will be taken over by the insurance.

Packing list: Just to point out few things that should definitely be part of your luggage if travelling to India. I would recommend to carry mosquito repellent or buy it on-site. Dengue fever, malaria and a lot more diseases get transmitted by mosquitoes. Furthermore your first-aid kit should contain medicaments against diarrhoeal diseases and disinfectant spray, for the treatment of minor superficial injuries.

ARRIVAL

On the night of the 28th of October I arrived at Bangalore airport. The entire immigration process took only some minutes and proceeded without any problems. Outside the good structured gigantic airport another intern from Switzerland and a colleague were already waiting for me. We took a cab to the apartment which was located right next to the office. The cab ride took around 1.5 hours and gave rise to the suspicion that apart from the airport the city and especially the traffic in Bangalore was not that well organised and structured.

The climate was pleasant and a nice alternative to the rainy and uncomfortable weather that one has to face in the end of october in Kiel (Germany).

Fig. 1: Traffic in Bangalore.

ACCOMMODATION

I was provided with my own room in an apartment, which was situated within a block called Diamond District. I shared the apartment, that consists of 2 bedrooms as well as 2 bathrooms and a huge living and dining room with the other *IAESTE*-intern from Switzerland. The apartment was big, clean and comfortable and I really appreciated that it was located within walking distance from the company, that I did not have to take any means of transportation to get to work.

As in Diamond District all the apartments were built around a beautiful park including a fitness center as well as a swimming pool, this block really deserves its name. Within a five minute walk, which did not requires any road crossing — that indeed needs some training, except you are a cow — the office could be reached.

BANGALORE

Bangalore — with more than 10 million citizens — is a lot more than just any Indian metropolis. The influence of western culture can be noticed everywhere in the city. Western nightclubs, karaoke bars, a pub culture with craft breweries and concerts, international restaurants as well as the online transportation network company *Uber* can be found in Bangalore and build the basis of a new lifestyle. However, a glance behind the facade quickly reveals a different Bangalore, with a huge amount of traditional and religious values.

This directly refers to a characteristic one face in India. Wherever you go you will notice extremes: poor people living in shacks only hundred meters away from the most expensive hotels of the city — farmers working with horses next to high technology companies — polluted, crowded cities next to staggering nature.

Bangalore traffic is a topic for itself. In this city, there is always traffic. Furthermore permanent honking cars and cows in the middle of a street seem to be one of the most normal thing on earth. It can take several hours to cover only a few kilometers. As the buses are often overcrowded I would recommend to choose the metro, if suitable for your route, or a cab for getting around in the city. The most common mode of transport in India — the motor-rickshaw — is a good alternative for short distances, but be aware that the most of the rickshaw drivers will offer their service to overcharged prices if they see a foreigner. Therefore a comparison of the offered price with the rates on the *Uber* or *Ola* App might be useful.

The cost of living in Bangalore are higher than in most other Indian cities. However, compared to Germany, the costs for food, accommodation and transportation remain cheap. Traditional rice dishes (e.g. Biryani) can be ordered from closeby places for around 65 Rupees (less than 1 €). Whereas the prices for international dishes can be a lot higher. The salary of 18 000 Rupees per month was sufficient to cover the common monthly expenses. However, for travels at the weekend some money should be carried.

The Indian kitchen has a lot to offer. There is a huge variety of dishes to be explored, especially for vegetarians and spicy-food lovers. If buying street food be aware, that the standards of hygiene not always are compatible with the European stomage. Furthermore restrict yourself to consume only bottled water.

Regarding the communication you will only face some minor problems. The majority of the people in India — especially in Bangalore — speak really good English. Therefore the communication at work as well as while travelling was quite easy.

WORK

Fig. 2: The humanoid NINO.

The company, *Sirena Technologies*, is a startup developing a humanoid robot called *NINO*. The aim of this project is to build an affordable robot, which should be used for educational purposes. As a teaching tool or assistant in colleges and universities, his aim is to support the teacher transferring content to the children and students and facilitate a new way of learning. Furthermore in higher grades *NINO* is seen as a helpful aid to teach the basics of programming and he will give hands-on experience in robotics. Based on the current planning, *NINO* will be introduced into market within the next six months.

The task I faced during my internship was to start the work on the field of Computer Vision here at *Sirena Technologies*. The interdisciplinary field — Computer Vision — deals with the aim of enabling computers to gain high-level understanding from videos or digital images. This includes the process of automating perception tasks, similar to the ones that are performed by the human visual system. In order for *NINO* to interact with the world that is surrounding him, it is necessary to give him eyes to see his environment. Cameras are the eyes to a robot. While adding cameras to a robot is a necessity these days, the work just begins from here. A whole bunch of algorithms right out of the field of Computer Vision need to be developed and implemented to make *NINO* to perceive and understand his environment. During my internship period I firstly concentrated on the implementation of a camera calibration software. Subsequently I implemented, using the OpenCV library, a face detection and tracking algorithm in order to make *NINO* to be able to interact with it's environment.

The team I was working in consist of 10 engineers, responsible for the development of Nino. I was received immediately in the team and I got the opportunity to work on a new project, which made the work challenging and the internship to an interesting and instructive period. Beside the unique corporate culture of this company which completely followed the slogan "do whatever you want, as long as your work is done" it was a great experience to have the chance to work in an emerging startup with very flat hierarchies. The working atmosphere at *Sirena Technologies* was very friendly and the enthusiasm of the employees for what they do was everywhere noticeable.

TRAVEL

Several extended weekend trips as well as day trips gave me the chance to experience and discover South India. As Bangalore is the center of South India, it is an ideal starting point for traveling around on weekends. I travelled to Goa, Gokarna, Kochi, Ooty, Manipal, Hampi and Mysore. Each of those places was unique and not comparable with the others, what demonstrates the wide variety India has to offer. Especially if travelling by night buses, all of the mentioned places were close enough for a 2-3 day trip. Night buses are quite cheap and seats do not need to be reserved much in advance.

Hampi and Kochi were my favorite places. Hampi with its historical temple ruins and breathtaking landscapes has a lot to offer and it is reasonable, that this temple town is recognised as a *UNESCO* World Heritage Site. Kochi and the backwaters is a very laidback and place, which invites you to relax from the busy city life and to enjoy nature.

Fig. 3: A few impressions from South India.

OVERALL EXPERIENCE

Overall, this internship has been a great experience. Besides gaining additional technical knowledge and getting to know the corporate culture of a startup, I got the chance to discover at least some parts of India and its culture.

India has a lot to offer and in my eyes it has a unique culture, that is really worth getting in touch with. Everywhere in India one can find controversies and chaos. But the chaos won't ever be a problem, because it belongs to society. This and a lot more observations I could make during my stay in India opened up for me a new perspective on our society.

The people in India are really friendly and helpful. Even if there does not exist a local *IAESTE*-committee in Bangalore itself I never faced the problem of feeling alone with problems or questions. My colleagues always took care of me and helped me whenever it was necessary. A lot of interesting and valuable conversations about cultural differences helped me to understand it better and aroused the fascination in me for this unique culture.

I want to thank *Sirena Technologies* and *IAESTE* to enable this internship and all the people I met during my stay and that made it that special and valuable for me.