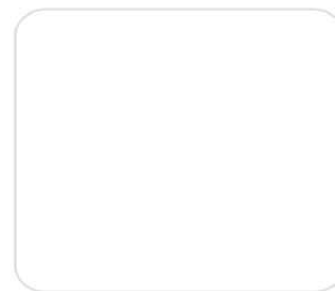
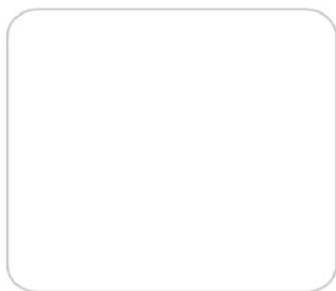
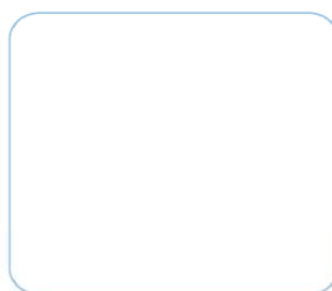
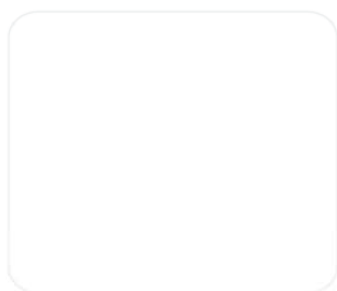


# Baden-Württemberg-Stipendium

## Personal Experiences of Jay O'Connor

1 December 2011 - 29 February 2012



Home University: Royal Melbourne Institute of Technology,  
Melbourne, Australia

Host University: Duale-Hochschule Baden-Württemberg,  
Stuttgart, Germany

Before I reflect on my three month stay in Stuttgart, I believe it is important to provide a little bit of background information about myself. I am a mature age student born in Melbourne, Australia, completing a Bachelor of Electronics and Communications Engineering at the Royal Melbourne Institute of Technology (RMIT). I specialised in signal processing, biosignals and software design over the duration of my studies. I have loved to travel my entire life, and have visited many countries, including Germany, in the past. It is no wonder I jumped at the opportunity to complete my studies by spending three months in Stuttgart as a part of a student exchange program between RMIT and Duale-Hochschule Baden-Württemberg (DHBW). One of the conditions for completing the Bachelor of Electronics and Communications Engineering degree was to undertake three months of work experience in the field relevant to my studies. During my final year at RMIT, my thesis supervisor Professor Dinesh Kant Kumar suggested participating as a research assistant in an exchange program to complete this criteria.

Having spent time in Germany previously on a few occasions, I was excited to learn I would be living in Stuttgart, which is situated in the south. I had never been to the state of Baden-Württemberg, having spent all of my time on previous stays in the cities of Frankfurt, Hamburg and Berlin situated in the north. Stuttgart is well known worldwide for its highly successful automotive industry, being the home of both Mercedes Benz and Porsche. The cities' engineering pedigree is world class, making it an incredibly attractive destination for any budding engineer. In addition, Stuttgart has much to offer to any self-proclaimed beer, food and sports enthusiast, including world famous wheat beers, the Bundesliga 1 team VFB Stuttgart, and amazing Swabian food.

In preparation for my stay I was in constant contact with the super-helpful Ms. Agnieszka Kucia of the International Studies Office (DHBW), who organised everything for me, including accommodation and financing, down to the finest detail. The entire process was extremely easy and pain-free, allowing me to focus on my final year of studies without any worries about the upcoming trip. As an Australian Citizen we are in the fortunate position of not requiring visas for short term visits to any European Union country, further simplifying the exchange process.

In my final year of study prior to my trip to Germany, I studied the German language for a year, which provided an extremely valuable basis on which to build upon during my stay. This was extremely helpful with the simple things like reading the menu, or catching up with local news, and just generally not feeling out of place. The biggest disadvantage of trying to practice my German verbal skills was that the majority of the people I spoke to would detect an accent, and start speaking back to me in perfect English. This was extremely convenient, however not the best scenario when trying to practice speaking German. On reflection, I feel that while my speaking skills may have improved only slightly, my reading skills and vocabulary have increased tenfold. I would definitely recommend learning at least the

basics of the language before heading to Germany, not because it is required, but because it helps to immerse yourself in the culture of a place.

As a mature age student living independently for the past sixteen years, living in shared student accommodation was an interesting experience. The accommodation provided was clean and spacious and I was happy to find all my housemates were friendly and easy to socialise with. Our apartment had a very international feel, with two students from Germany, one from Ukraine, one from Portugal and one from China. I cannot thank these guys enough for the relaxed atmosphere and advice they provided during my stay. It would be remiss of me not to mention the fantastic internet access speeds provided by WH-NETZ, which enabled me to keep in contact with my family and friends at home.



**Last night in Stuttgart with flatmates. From Left Me, Raphael, and Junjie.**

Upon arrival to the DHBW campus I was warmly welcomed by Ms. Kucia and Professor Hans Weghorn who provided me with a tour of the impressive university facilities, including the office space I would spend my next three months in. My first task involved finalising software designed to control a motorised wheel-chair using only the sEMG biosignals obtained from the forearm. This was an extension of the research I did for my final year thesis at RMIT in Melbourne. This project involved optimising real-time signal processing algorithms and designing a biosignal data capture system. Finally a Bluetooth communication protocol was added to control the device wirelessly. My next task involved designing, simulating and manufacturing a biosignal amplifier for use with the software

previously discussed. The labs used to manufacture the PCB and complete testing were some of the best I had seen, including a fantastic PCB etching machine, enabling easy fabrication of a multi-layer SMD prototype PCB. This project was extremely successful and along with my colleague Sruthi Sahebjada, a fellow RMIT student who documented my findings, we submitted a conference paper outlining the real-time wheel-chair control system which was accepted as a full paper at the IADIS E-society (March 2012), Berlin.

My next task was a software/hardware system used to accurately measure the speed of a treadmill over time, to be used as a reference point in a study designed to improve the reporting of portable sports devices. The findings of this study will be used as a part of a paper currently being researched by Professor Weghorn.

Overall, I was impressed by the Mechatronics Faculty facilities and staff. I would like to extend a special thank you to Mr Smagacz and Mr Fröb for their technical expertise, and providing access to all the testing equipment I required during my stay.

Winter was an amazing time to visit Stuttgart. In December, the Christmas Markets provided a wonderful atmosphere and aroma, as the scent of gingerbread and warm spiced wine filled the streets. This was a welcome change from the traditional 'Aussie' Christmas which normally involves hot weather, barbecue and beer. It was also a great opportunity to buy many handcrafted souvenirs for friends and family back home. This was my first experience visiting Germany in winter, and the sight of the snow covered hills and vineyards surrounding the city centre was spectacular. The public transport in Stuttgart is easily the best I have ever used. The longest I ever waited for a train was 8 minutes, and that, when compared to Melbourne, is high praise. The city was very clean and well maintained, and I felt safe at all times during my stay. One of the highlights of my stay in Stuttgart was visiting the Mercedes Benz museum. As a car enthusiast, the ability to literally walk through the history of the automobile, from its humble beginnings, through to the modern day wonders such as the Formula One, made it an experience I won't forget. The view from the first TV tower in Germany over the snowed in Stuttgart was like a postcard. Unfortunately, the day we visited the top of the tower, it was approximately – 20 degrees C, and we had to cut our visit short. There are too many great experiences to list here, but my personal favourite memories involved visiting the local pub with my housemate Daniel, and avid VFB Stuttgart football club supporter, and watching the game on TV with the locals, while enjoying fine local food and beer.

Due to its central location in Western Europe, Stuttgart is an ideal base for travel all across Europe. I took advantage of this at every opportunity, visiting friends throughout Belgium, The Netherlands and northern Germany. It turned out the highlight of my travels was much closer to home than anticipated – 45 minutes away, the small town of Heidelberg was an ideal weekend getaway. The walk around the gardens and ramparts of the medieval

Heidelberg Castle on the hills above the town was honestly one of the best experiences of my life, and I would recommend it to anyone.



**In front of the Heidelberger Schloss.**

My advice to students preparing for their exchange would be to figure out exactly what you need for your project before setting off, especially for non-standard requirements, and bring any non-standard materials with you if you can. My project required the use of specialised biosignal electrodes, which I unfortunately did not bring with me. This delayed the progress of the project as these were not available on campus and needed to be procured separately.

I would like to extend my gratitude to the Baden-Württemberg-Stipendium who fund the exchange program, as well as Professor Kumar and Professor Weghorn for the opportunity to participate in this program, and their expert guidance. Without their advice the project would not have come to a successful conclusion. Also many thanks to Ms Kucia for her help and warm hospitality – her office truly makes an effort to make all exchange students feel at home. This was an invaluable cultural and technical learning experience for me, and I hope to return very soon.