13 MONTH PLACEMENTS FOR STUDENTS IN COMPUTER SCIENCE (CS), COMPUTER ENGINEERING (CE) or ELECTRICAL ENGINEERING (EE)

These placements start July 2016 and end August 2017

Caterva is a high-tech start-up company, well-funded, and run by experienced entrepreneurs. Their headquarters are in Pullach, a 15 minute commute from central Munich. Start-up companies are dynamic and exciting, so Caterva are looking for smart people, who relish a challenge and have a can-do attitude. If you have ambitions to run your own business in the future, this may be THE placement for you!   www.caterva.de

Caterva – Unique Solutions for Energy Storage

Caterva has developed a networked energy storage system for the German market that combines the local use of solar power with grid services.

There are more than 700,000 photovoltaic systems (PV) installed on the roofs of family homes in Germany. Crucially, since 2012, the cost of power from the mains grid is significantly higher than the cost of power harvested from a private PV system. At the same time, the subsidies paid for power fed into the grid have dropped sharply for newly installed PV systems. As a result, families are starting to use their roof generated power rather than sell their power to the grid. But using their own power usually requires people in the home to use it, which is inconvenient as families are often out when the supply of solar power is at its highest.

Energy storage can overcome this issue – power can then be consumed independent from the sunshine!

Unfortunately battery costs today mean that these systems never recoup the investment. Caterva has solved this issue with combined applications running on the same energy storage system: in addition to supporting the private household with stored energy, the Caterva storage solution offers frequency stabilization services to the grid as well.

Caterva Technology

The mains power system is moving into a world of decentralized systems, comparable to the move from mainframe computers to personal computers. Decentralized storage systems will play a key role. Caterva is developing the control software running on each storage system as well as the software running on the central control site. Caterva installed the first group of systems in 2014. In the future, hundreds, and even thousands of these storage systems will be combined virtually to create the equivalent of a major power plant, with the individual systems centrally controlled through a virtual private network.

INTERNSHIPS

Successful candidates will work in the development lab of Caterva or in the software team.

Caterva has a fast cycle develop, test and deployment process, that will give the successful candidates unbeatable professional experience for their future. Also, interns will have freedom on deciding how their development is implemented, giving meaningful responsibility throughout the cycle. Most importantly, the interns will be able to see how their work performs and adds value to the company.

There will be also regular involvement with marketing, sales, and manufacturing - offering a good opportunity to gain experience in all areas of the business. These year-long placements will allow the candidates to become fully familiar with Caterva technology and have a real chance to contribute to the development of the organization and the technologies used. As the company grows, it is likely that some of the Interns will return as employees after their graduation.

Activities you will perform:

Web and Mobile Front-end Developer

To give customers access to their energy storage system data at any time and any place, Caterva is developing a web-based interface for smartphones and tablets. This task is especially challenging due to the difficulty of presenting technical data in an easy to understand and attractive way to non-expert users. Your duties will include:

- ✓ Evaluate alternatives for data presentation on mobile devices
- ✓ Design and implement an attractive front-end following Caterva design rules
- ✓ Integrate the front-end into multiple mobile platforms (e.g. android / iPhone app container or embedded browser)
- ✓ Implement the interface to the server-side data
- ✓ Administrate and maintain your own development
- ✓ Test and document all components

C++ Software Developer, with focus on communication technology

To provide the power transmission system operator (TSO) with real-time information about the Caterva system through a secure channel, we are developing a software component that sends data from our control center database to the TSO counterpart. Your duties will include:

- ✓ Clarify the interface details
- ✓ Establish a secure and robust connection using standard components (IPsec, SSH tunnel or openVPN)
- ✓ Design and implement a daemon to read, process, and convert data from the database, and send data to the TSO control center
- ✓ Integrate the daemon into the live system
- ✓ Test and document all components

Power Electronics Engineer, with focus on batteries and power conversion

To improve the performance and efficiency of energy storage systems, Caterva is developing novel concepts for combining power converters with batteries in the home. The goal is a transformerless set-up with a minimum of filters. Your duties will include:

- ✓ Assemble and conduct tests on energy storage system prototypes
- ✓ Evaluate electronic components (converters, filters, resistors)
- ✓ Analyze device faults and propose countermeasures for serial production
- ✓ Improve Caterva's electronics laboratory setup
- ✓ Document all work

Market Analyst and Database Developer, with focus on electricity markets

To satisfy the demanding requirements of the TSOs and to optimize the cash flow from the existing swarm of energy storage systems, Caterva is developing an automatic trading system for the European electricity markets. This task is especially challenging owing to the breadth of data being aggregated and the high business impact. You will work side by side with an experienced software development team. Your duties will include:

- ✓ Design the data acquisition services
- ✓ Model the archive databases
- ✓ Implement and test the data handling subsystem
- ✓ Deploy and administrate the system
- ✓ Document all work

Skills you will acquire during the placement:

Technical Knowledge:
- Understanding of energy technologies such as batteries, power converters, and the issues surrounding stabilization of the mains power grid
- Experience of the control software used for the storage systems and control of the network
- Understanding of secure communications, especially in the energy context
- Knowledge and hands-on experience of product development.

Full mentoring will be provided at Caterva.

Work Skills: working efficiently and effectively, being responsive, understanding organizations and teamwork. A complete working experience in a leading engineering startup that enables you to grow as a professional engineer.

Communication Skills: the communications skills needed to work in a dynamic company: face-to-face, telephone, web meeting, and e-mail. Highly proficient use of English, particularly for technical subjects, enabling effective and clear communication.

Marketing: Understanding the growing market for Caterva technologies, and gaining a genuine appreciation of the market trends from an insider's point of view.

Relationships: Working in a multi-cultural environment. Regular interaction with management.

Recruitment: a unique element in these placements is that in 2017, the current Interns will be involved in the recruitment process for their successors and running the initial selection process. They will then give training to their successors during a handover period (hence a 12 month placement plus one month handover).

Working Conditions & Remuneration:
- Location – Munich, Germany. An international city friendly to students from all over Europe! Excellent public transport, buzzing nightlife, outstanding sports activities – in short "a cool destination"
- Collegiate company environment: everyone working together on common goals
- State-of-the-art development Labs with excellent tools and equipment
- Training: excellent on-the-job training
- Salary: €1600 to €1,750 Euros pre-tax per month, depending on experience
- Salary paid monthly - so you must be able to support yourself during your first month.
- Paid holiday allowance of 25 days per year plus the German/Bavarian public holidays.
- €450 relocation allowance payable in your final month at Caterva to assist with relocation costs back to your University.

Individual Requirements

Applicants MUST meet the following criteria:
- Be available for a placement of at least 13 months
- Able to retain their student status throughout the placement because the placement is a required or optional part of their course (not a "Student in suspense"). Your University is required to sign an Internship Contract with Caterva.
- Be fluent in English, written and spoken
- The drive and motivation to accept new challenges

Nationality:
- You are required to provide a scan of your passport information page
- Most of these positions will be filled by citizens of the European Union or Switzerland
- One position is available for a non-EU citizen. (Caterva will obtain the required work permit, but the placement will be fixed at 12 months maximum)

General skills you should have:
- The ability to learn quickly
- A keen sense of responsibility
- The maturity to work with minimal supervision
- The ability to live independently away from home

Specific skills desirable for the four positions:

Web and Mobile Front-End Developer

- Experience of web design or mobile development
- Experience with HTML5, CSS and JavaScript
- Good knowledge of Java is very useful
- Experience managing productive environments (web servers)
- Confident working with databases

Communications Developer

- *Confidence with Linux platforms*
- *Experience with C++ programming*
- *Experience with Java programming*
- *Application level knowledge of openVPN and SSH*
- *Experience with bash shell scripting*
- *Knowledge of JavaScript server programming (nodejs) is useful*

Power Electronics Engineer

- Both practical and theoretical problem-solving abilities
- Passion for and understanding of power electronics
- Confidence with electric measurement instruments (oscilloscope, power meter)
- Experience with IGBT-based power converters (10-30kW range) and transformers is useful
- Experience with batteries and BMS useful

Market Analyst and Database Developer

- *Good knowledge of object oriented programming, preferably Java*
- *Confident working with databases*
- *Understanding of basic web technologies and communication protocols*
- *Experience with Linux shell environments*
- *Familiarity with data mining and big data technologies is useful*
- *Knowledge of statistics and analytic methods is useful*

Other skills we value, but which are not essential:
- Additional language skills (apart from English). German is useful socially
- Previous work experience
- An appreciation of different cultures

Applications

TIMING: applications will be assessed as they are received, so applying early increases your chances! The latest submission date is 31st March 2016.

APPLICATIONS:
1. Send your CV and a cover letter in English, along with a scan of your Passport by email to: **caterva@theofficeonthenet.co.uk**,
   - The cover letter should detail why you are applying for this job, and how you satisfy the

criteria required. It should not be more than one side of A4.

2. During January and February, CVs will be assessed and selected candidates will be offered a telephone interview.
3. The first interviews will look at your technical skills
4. If your skills match Cateva's needs, a second interview will be offered to review your career plan and your motivation for applying.
   ALL the interviewers in these first two stages have previous experience of completing successful Internships in Munich.
5. At least half of the successful candidates from this process will also be interviewed by Robert Owen who is supervising this process.
6. Candidates that pass these stages will then be shortlisted for interviews by Caterva which could involve current students and technical supervisors.
7. Suitable candidates will be offered positions quickly to ensure that no candidates are lost through waiting. We expect the process to be fully completed and all offers made by the end of April.
8. Successful candidates will start at Caterva in July – date to be mutually agreed.

For more information:
Essaimage Associates (www.essaimage.com) are running this recruitment process for Caterva.
They have 22 years' experience running 13 month placements across Texas Instruments Europe, EnOcean GmbH, and Imagination Technologies.
You can address your questions to Robert Owen, Director: e-mail: rcwo@compuserve.com