ABB is a leader in power and automation technologies that enables utility and industry customers to improve performance while lowering environmental impact. The ABB Group of companies operates in around 100 countries and employs around 120,000 people.

Strong positions in research & development are a prerequisite for ABB's business success. Essential contributions grow out of the collaboration of ABB's research and operational organization. Our Corporate Research Center close to Heidelberg in Germany is one of seven ABB Corporate Research Centers worldwide.

Our department "Industrial Software & Applications" offers a diploma thesis on the following topic:

### Design and Implementation of a Software Quality Monitor

**Motivation:** During software development, software quality often deteriorates due to pressing time schedules or change of personal. This complicates maintenance activities and may even be a source for errors. A possible solution to this problem is to monitor different metrics about the software periodically during development (e.g., weekly). Such metrics comprise code metrics (e.g., cyclomatic complexity, package cycles, large classes, long methods), failure metrics (e.g., bug reports, compiler warnings), or customer metrics (e.g., complaints, customer satisfaction survey). These metrics can be condensed into an index quantifying current software quality. If the index sinks beneath a given threshold, managers and developers can schedule additional refactoring or bug fixing activities. Such a metrics monitoring framework has already been implemented for Java systems (i.e., ISIS, http://goo.gl/HCMxs), but cannot be directly applied for the C++ systems at ABB.

**Your tasks:** The goal of this diploma thesis is to design and prototypically implement a software quality monitoring framework for C++ code. You will first learn the ISIS approach for Java systems and then capture requirements specific for C++ code and ABB systems. To capture the metrics, adequate tools need to be selected and integrated. You will prototypically implement a tool or script to collect the metrics recorded by the different tools and to condense them into a quality index. To prove the concept of the software quality monitor, it shall be applied post mortem on data collected from one ABB system. The quality index for this system shall be derived and graphically visualized to analyse the development history.

**Your profile:** We expect a highly motivated computer science student familiar with C++ programming and Microsoft Visual Studio.

**To apply:**
Contact Dr.-Ing. Heiko Koziolek
heiko.koziolek@de.abb.com
Phone: +49 (0) 6203-712138