You are interested in software technologies and want to apply them in a challenging and fascinating environment? Then join our international team of highly motivated researchers to develop the foundations for the next generation of ABB automation systems.

**Location:** Ladenburg, Germany  
**Department:** Industrial Software & Applications

**Your tasks:**
ABB provides hardware and software for control systems to operate a multitude of industrial facilities, e.g., factories, power plants, ships, and mines. To plan and configure such systems, numerous software tools capture models from various engineers in many data formats. For example, the models include factory structures, behaviour of automation controllers or robot kinematics. Keeping this diverse range of overlapping models consistent is a challenging task, which is today mostly done manually.

The Vitruvius approach, which is being developed at Karlsruhe Institute of Technology (KIT), is a model-driven framework for consistency preservation and view-based development.

In this thesis, you will conceptualize and implement a method for applying the Vitruvius model consistency approach to AutomationML models in order to support consistency checking. You will work with the Eclipse Modeling Framework (EMF) to import AutomationML files in a standardized meta-model, define consistency rules with Vitruvius’ declarative correspondence rules, and analyse whether inconsistencies between different models can be resolved automatically. You will test your solution with real-world engineering scenarios.

**Requirements:**
- You are a highly motivated student of computer science looking for a master thesis (6 months).
- You have experiences in object-oriented programming (C# or Java) and common IDEs (Visual Studio or Eclipse).
- As a good communicator, you have sound English skills in speaking and writing.
- (Optional:) Experiences with model-driven software development, UML, EMF, Xtext, QVT
- (Optional:) Experience with XML, AutomationML, PLCopen, CAEX, or COLLADA

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ABB (www.abb.com) is a leader in power and automation technologies that enable utility and industry customers to improve performance while lowering environmental impact. The ABB Group of companies operates in around 100 countries and employs about 145,000 people.

ABB Corporate Research, in close collaboration with ABB business units, is developing the foundations for the next generation of ABB products. You will work in an international and creative project team with a wide range of experience and expertise. We offer multi-disciplinary collaboration, applying your knowledge to real applications and products, and experimenting with tomorrow’s technologies.

**Our ambition.**  
**Your legacy.**