ASSA ABLOY

ASSA ABLOY Master Thesis Program

Spring 2027

ASSA ABLOY Landskrona

ASSA ABLOY is the global leader in access solutions. Every day we help people feel safe, secure and experience a more open world.



Kickstart Your Career with ASSA ABLOY

Are you looking for a meaningful way to complete your Master Thesis?

Join us at ASSA ABLOY and build a career you can be proud of – while helping us continue to create a safe, secure and more open world!

Each year, we welcome Master Thesis students from diverse engineering disciplines – mechanical, electronics, computer science, industrial engineering, and more. Over six months, you'll dive into real-world challenges, supported by experienced managers and our vibrant student community, former thesis students who now work with us. Social activities like breakfasts and after works will help you build your network and feel at home from day one.



Applications are open Oct 27 – Nov 18:

Jobs for students, graduates and interns | ASSA ABLOY

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Why complete your Master Thesis with us?

💡 **Innovation & Impact** – Work on projects that matter, contribute to real solutions, and help shape the future of access.

🌍 **Global Opportunities** – We're part of a large international group where you can build a career to be proud of.

🤝 **Supportive Culture** – Our student community, buddy system, and regular social activities ensure you're never alone and always feel connected.

🚀 **Career Development** – Many of our students go on to join us full-time – your thesis could be the first step in a long and exciting journey.





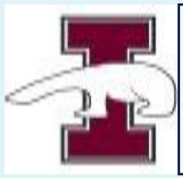
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About these slides

The scope of master thesis projects change as the project progresses, and we adapt them to the students we take in. This means that what is written on the slides will not be the exact description of the projects when we decide on the details together.

Even though we mostly advertise towards LTH, we have and do recruit from all of Sweden. If you are unfamiliar with LTHs guild sigils, you can find the one most like your specialty to the right. ⇨

Finally, come meet us at ARKAD! There we can get to know each other and dive deeper into the projects that interest you the most.



Industrial Engineering & Management



Mechanical Engineering



Electrical Engineering



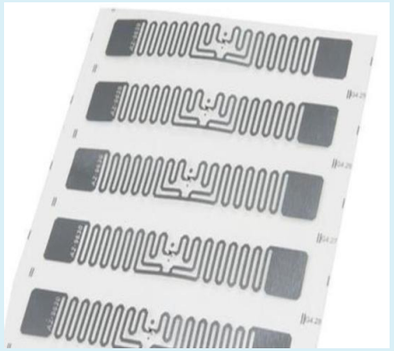
Engineering Physics



Computer Science & Engineering

1 Store Service log in RFID / NFC label.

- Deep dive into the new Machinery regulation to understand the requirements.
- Investigate the market for cost efficient technical solutions that can be attached on doors in the installed base.
- Calculate required amount of data to store.
- Create a working prototype that can be demonstrated.
- Validate the proposed technical solution to understand if it solves the problem.







Roger Dreyer / Fredrik Brödje

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2 Mode selector with standard Key Cylinder

- Collect needs and requirements.
- Ideate to find some technical solutions.
- Main Challenge is to be able to retract the key in all positions.
- Validate and Select most promising solution.
- Create a prototype.
- Validate the prototype with a reference group.









Roger Dreyer / Louise Bannersten

3 How will the Retail market develop the next 5-10years and how can ASSA ABLOY contribute to that.

- Investigate current retail market with regards to their future needs.
- Identify needs that ASSA ABLOY could help providing solutions to.
- Set up a suggested business proposal that we can offer our Retail customers.
- Base the business proposal on a clear business case.



Roger Dreyer / Thomas Böhler

4

Over Head Sectional Door Single panel design

Over the years, multiple acquisitions have resulted in several different sandwich panel designs across Europe. This creates duplicate development efforts, fragmented knowledge, and limits the ability to leverage global production capabilities. Can we create a single panel platform that combines the best features from all existing designs while remaining compatible with different manufacturing methods?

This thesis offers the chance to shape the future of an entire product family. Your work could establish a common platform used across multiple factories, improving efficiency, accelerating innovation, and preserving critical engineering knowledge for future generations.

Expected Activities

- Analyse existing panel designs and production methods.
- Identify the strengths and weaknesses of each concept.
- Develop a unified panel platform suitable for multiple factories.
- Evaluate manufacturing, performance, and cost implications.
- Investigate interchangeable embossing designs for local branding.
- Define recommendations for long-term product ownership and development.

Key Question: *Can one global panel platform combine the best engineering solutions across the company while preserving local flexibility and identity?*



Anders Löfgren / Linus Ljunghusen

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5 Over Head Sectional Door Single panel joint

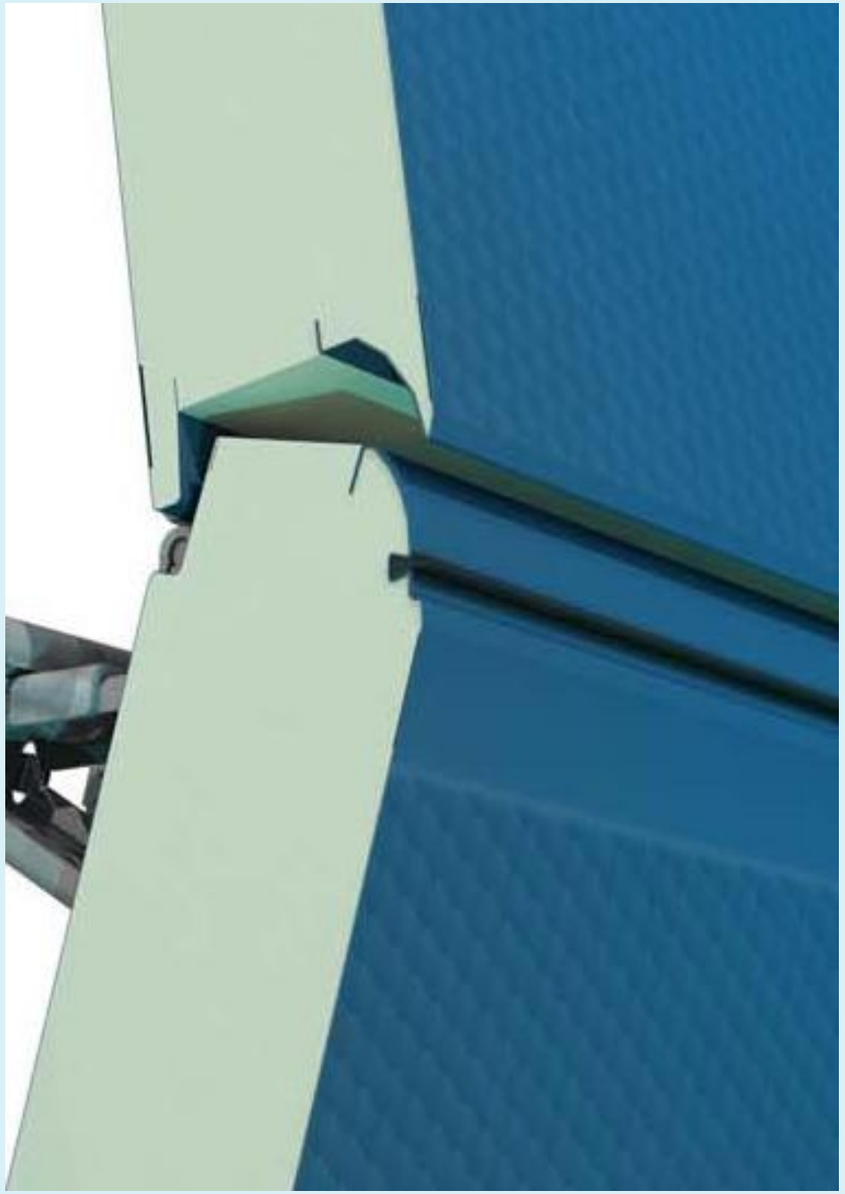
Today's sandwich panels integrate the panel and joint into a single component. But what if the male and female joints were separate parts? This could enable simpler panel production, new insulation materials, and greater design flexibility. The challenge is to determine whether the benefits outweigh the added cost and complexity.

This thesis explores a completely new panel architecture with the potential to change how industrial door panels are designed and manufactured. Your work could unlock new materials, improved performance, and innovative engineering solutions.

Expected Activities

- Develop concepts for separate panel joint systems.
- Investigate manufacturing and assembly implications.
- Evaluate cost, material usage, and production complexity.
- Assess effects on thermal insulation and energy efficiency.
- Analyze structural performance and load transfer.
- Explore reinforced joint designs using trusses or other strengthening features.

Key Question: *Can a modular panel design create a more flexible and higher-performing door without increasing cost and complexity?*



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6 Over Head Sectional Door Panel height investigation

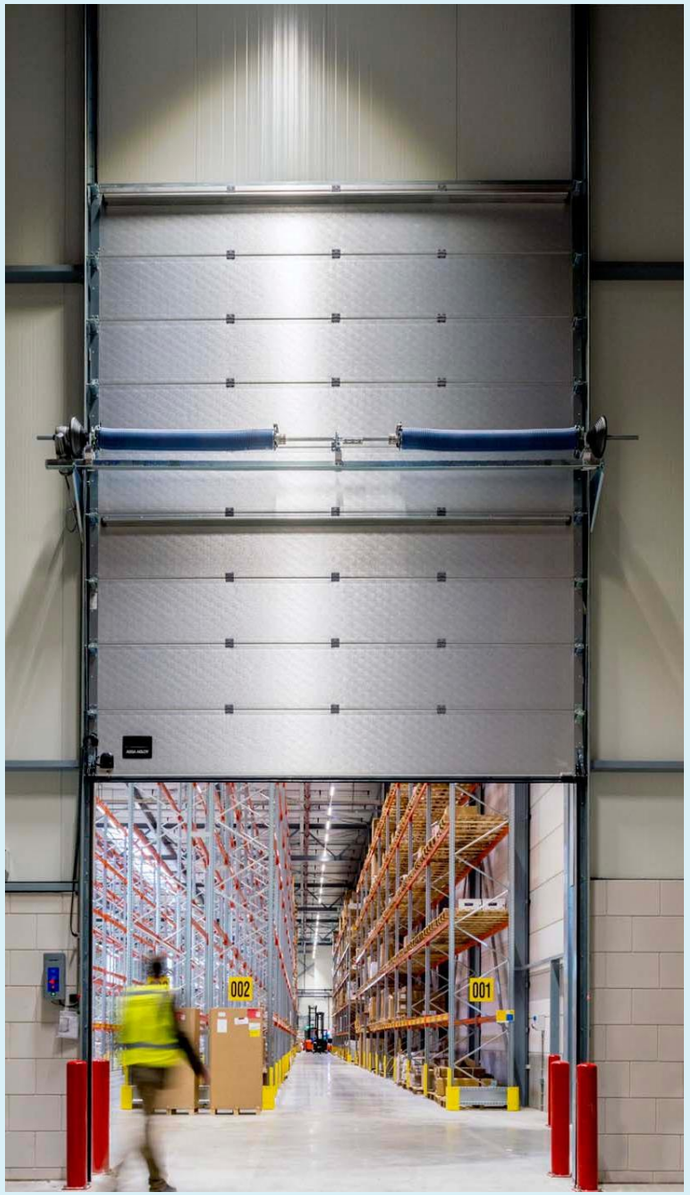
We currently use a single panel height for all doors. While this simplifies production, it may not be the most efficient solution. Can sales data help us identify a smarter range of panel heights that reduces the number of panels per door while improving overall performance?

Your work could directly influence future product design by balancing manufacturing efficiency, installation practicality, structural performance, and energy efficiency.

Expected Activities

- Analyze sales data and door size distributions.
- Develop and evaluate optimal panel height concepts.
- Assess impact on production and inventory complexity.
- Investigate installation and handling considerations.
- Evaluate effects on strength, insulation, and overall door performance.
- Recommend the best solution based on technical and business value.

Key Question: *Can data-driven design create a better door for both customers and manufacturers?*



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Over Head Sectional Door Optimized roller bracket

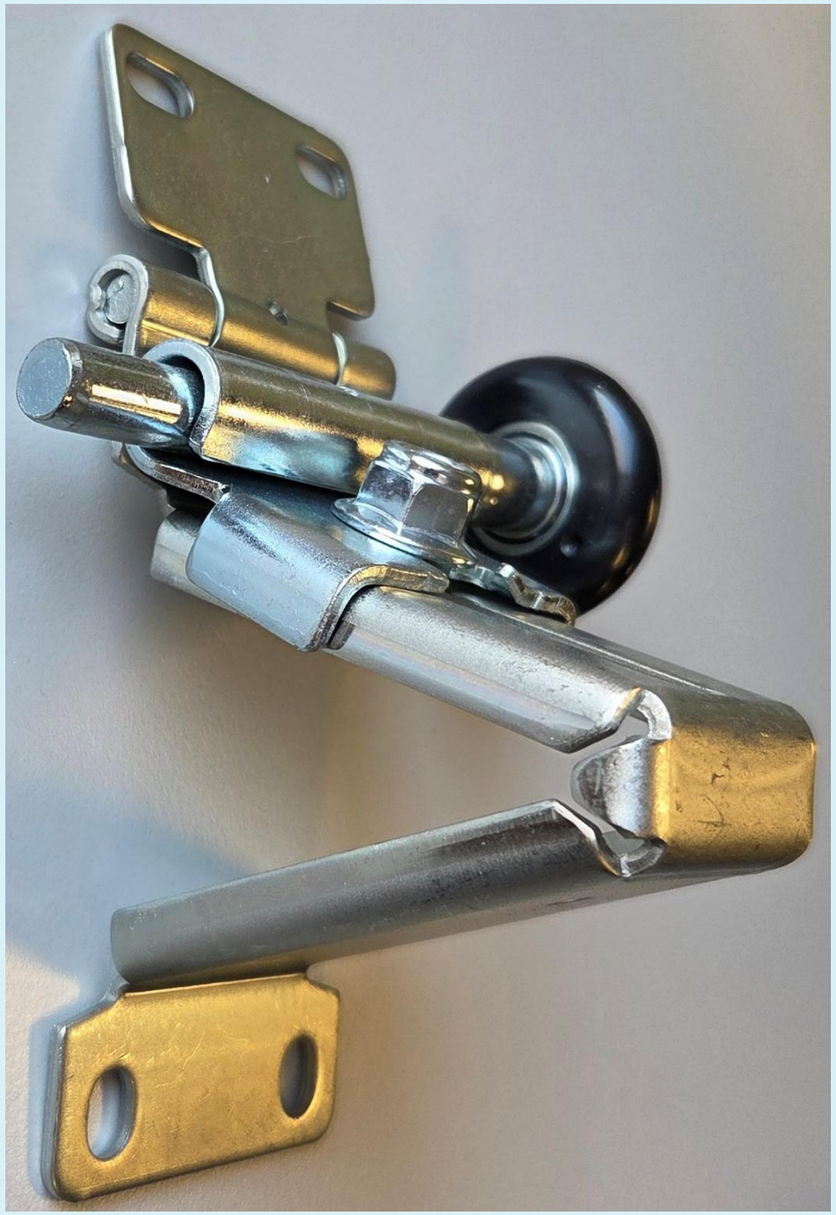
Rollers and roller brackets are among the most frequently used components in our doors. While each part is relatively inexpensive, even a small cost or performance improvement could have a significant business impact. Can a smarter roller concept improve performance, reduce cost, and better match the needs of different door sizes?

This thesis offers the opportunity to optimize a high-volume component that directly affects cost, durability, and door performance. Your findings could influence future product platforms across a large part of our portfolio.

Expected Activities

- Analyze current roller and bracket designs and their usage.
- Investigate load limits and key performance constraints.
- Evaluate whether multiple roller sizes would be beneficial.
- Identify opportunities for cost and material reduction.
- Develop concepts for more compact brackets with maintained adjustability.
- Assess effects on durability, installation, and overall door performance.

Key Question: *Can a family of optimized rollers and brackets deliver better performance at lower cost while meeting the needs of every door size?*



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8 Over Head Sectional Door Lightweight burglary protection

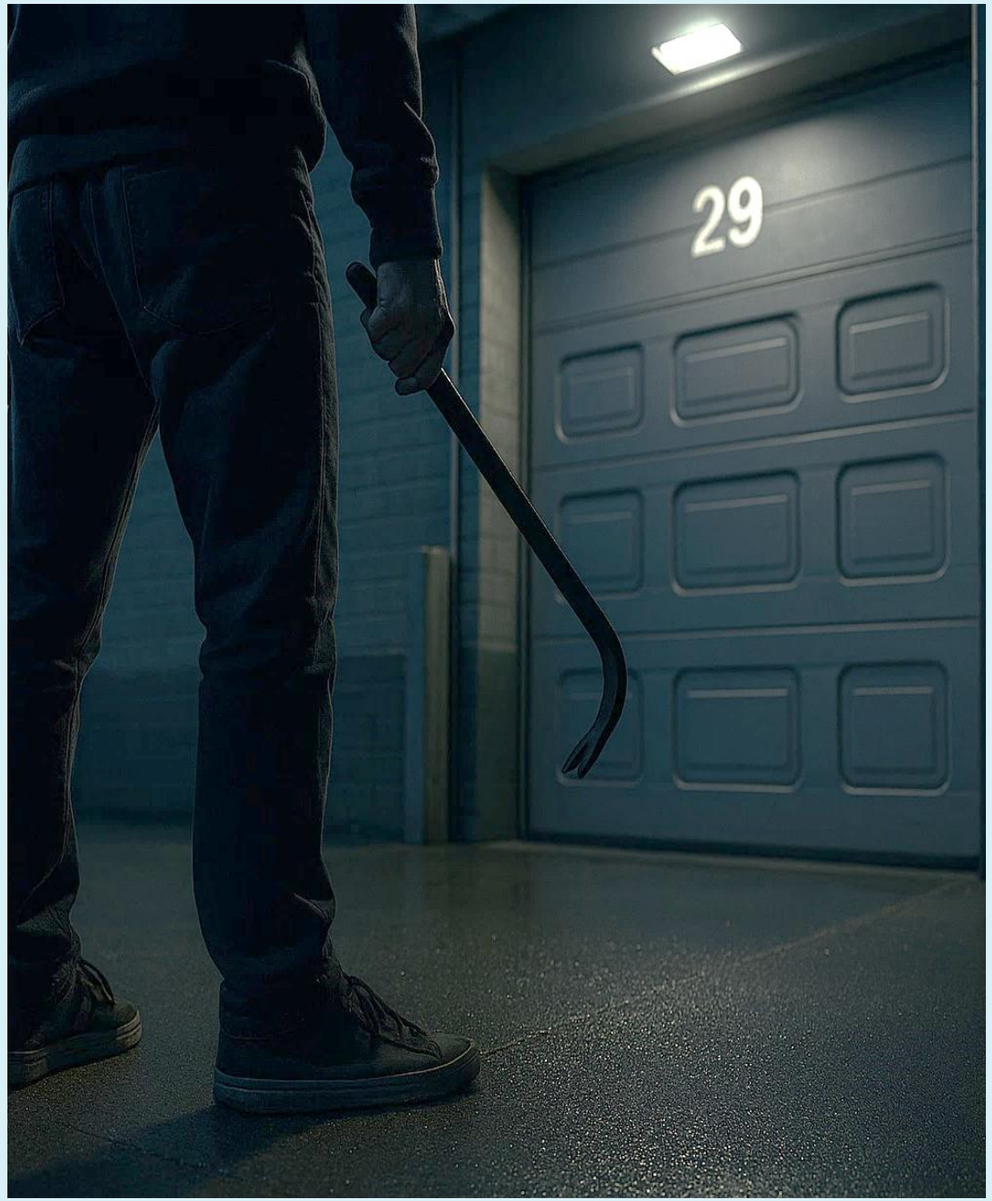
To achieve high burglary resistance today, we reinforce our door panels with internal steel plates. While effective, this adds significant weight, affecting spring systems, handling, and overall door performance. Can the same level of protection be achieved with a lighter and smarter solution?

This is an opportunity to rethink security door construction from the ground up. Your work could lead to innovative solutions that improve security while reducing weight, material usage, and installation effort.

Expected Activities

- Investigate how current panels resist crowbar attacks.
- Identify alternative materials and reinforcement concepts.
- Explore solutions integrated into the panel, insulation, or joint design.
- Evaluate effects on weight, cost, manufacturability, and performance.
- Assess burglary resistance through analysis and testing.
- Compare concepts and recommend the most promising design.

Key Question: *Can we create a lighter door that is just as secure against forced entry as today's reinforced designs?*



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9

Over Head Sectional Door Thin glass

Glass vision sections provide daylight and visibility, but they also add significant weight to the door. This creates balancing challenges, increases spring requirements, and can affect usability. Could ultra-thin glass technologies, inspired by products used in consumer electronics, provide the strength and durability required while dramatically reducing weight?

This thesis explores the intersection of material science, structural engineering, and product development. Your work could enable larger glazed areas, lower energy consumption, and lighter doors without compromising safety or durability.

Expected Activities

- Analyze the limitations of current glass solutions.
- Investigate ultra-thin and high-strength glass technologies.
- Evaluate structural performance and impact resistance.
- Assess weight reduction and thermal performance benefits.
- Study manufacturing, handling, and cost implications.
- Develop and compare concepts for future door designs.

Key Question: *Can next-generation glass technologies make large glazed door sections lighter, stronger, and more energy efficient than today's solutions?*



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10

Over Head Sectional Door Wireless CAN communication

Our latest door design places the motors directly on the door, eliminating the traditional balancing shaft. With wireless battery charging already available, the remaining challenge is the communication cable between the control unit and the door. Can reliable, real-time wireless communication replace the cable while maintaining the safety and performance required for critical functions such as emergency stopping?

This thesis sits at the intersection of electronics, software, and product development. Your work could help create a truly wireless industrial door that is easier to install, simpler to maintain, and ready for the next generation of connected products.

Expected Activities

- Evaluate wireless alternatives to CAN communication.
- Define requirements for latency, reliability, and safety.
- Investigate cybersecurity and communication robustness.
- Design and test a wireless communication architecture.
- Assess performance under industrial operating conditions.
- Compare installation, service, and cost implications.

Key Question: *Can a wireless communication system deliver the speed, reliability, and safety needed to replace the last cable in an industrial door?*



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Over Head Sectional Door BLDC motor platform

Today we use two fundamentally different motor technologies: an AC motor for spring-balanced doors and a BLDC motor for doors where the motor lifts the full door weight. Could a single BLDC platform replace both? This thesis explores the technical, commercial, and architectural implications of using BLDC technology across a much larger portion of our product portfolio.

This is an opportunity to challenge decades of design tradition and investigate whether one motor technology can simplify our products, improve functionality, and reduce long-term complexity. Your work could influence the future motor strategy of an entire product range.

Expected Activities

- Compare BLDC and AC motor performance in spring-balanced doors.
- Determine practical limits regarding door size and weight.
- Evaluate safety functions based on force detection and motor current monitoring.
- Develop concepts for highly integrated motor and gearbox solutions.
- Explore innovative designs such as motors integrated into cable drums.
- Assess cost, efficiency, installation, and maintenance implications.
- Create proof-of-concept designs and recommendations for future platforms.

Key Question: *Could a single BLDC motor platform replace today's multiple drive technologies and become the foundation of the next generation of industrial doors?*



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Over Head Sectional Door Motor performance investigation

In our test facilities, some motor systems can lift doors weighing up to 280 kg, while seemingly identical systems in the field struggle with doors weighing only 160 kg. Is the root cause hidden in the motor, gearbox, brake, manufacturing tolerances, environmental conditions, or perhaps in the door itself? This thesis aims to uncover where the performance is really being lost.

This is a hands-on engineering challenge combining mechanics, electronics, testing, and data analysis. Your findings could directly improve product reliability, reduce warranty costs, and ensure every customer receives the performance they expect.

Expected Activities

- Analyze motor, gearbox, and brake performance variations.
- Investigate the impact of manufacturing tolerances.
- Evaluate the effects of temperature and operating conditions.
- Measure friction and efficiency losses in complete door systems.
- Develop methods for screening motor systems before delivery.
- Identify root causes and propose design improvements or proof-of-concept solutions.

Key Question: *Why can two seemingly identical motor systems deliver vastly different performance, and how can we ensure every door performs as designed?*



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Over Head Sectional Door
Safe and reliable open CAN com.

One of our motor platforms relies on a licensed CAN communication stack, adding cost to every product sold. Can an open-source alternative deliver the same reliability, safety, and regulatory compliance? This thesis will investigate whether a transition is technically feasible and what it would take to make it happen.

This is a rare opportunity to influence the core communication architecture of future products. Your work could reduce recurring costs, increase flexibility, and potentially lead all the way to a working proof-of-concept implementation.

Expected Activities

- Identify and evaluate available open-source CAN stacks.
- Assess compliance with safety requirements and machinery regulations.
- Benchmark performance, reliability, and maintenance implications.
- Investigate CAN solutions already used within the company.
- Develop a migration strategy from the current licensed solution.
- Create a proof-of-concept or prototype implementation.
- Recommend the most suitable solution for future products.

Key Question: *Can an open-source CAN stack match the safety and reliability of today's licensed solution while reducing cost and increasing flexibility?*



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Over Head Sectional Door
Science of door balancing

Ten years ago, some of our doors could be balanced using half the number of springs required today. Has the door become heavier, or have we lost knowledge about spring design and material performance? This thesis investigates whether modern spring calculations, specifications, and purchasing strategies are truly optimized.

This is a rare opportunity to combine mechanical engineering, materials science, and product development to solve a problem with direct impact on product cost and performance. Your findings could help reduce material usage, improve door balancing, and challenge long-held assumptions.

Expected Activities

- Compare historical and current spring designs and calculations.
- Investigate spring wire materials and supplier differences.
- Analyze the factors limiting spring performance today.
- Evaluate opportunities to reduce spring count and material usage.
- Develop improved spring calculation methods and specifications.
- Recommend an optimized strategy for future spring design and sourcing.

Key Question: *Have we forgotten how to design efficient spring systems, and can we rediscover a smarter way to balance ever-heavier doors?*



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15

Over Head Sectional Door
Low volume custom drum

Most doors can be balanced using standard springs and cable drums, but some unique configurations fall outside the available range. Custom components are often expensive and slow to source. Could locally manufactured or even 3D-printed drums provide a fast and cost-effective solution for these special cases?

This thesis combines mechanical design, manufacturing technology, and business case evaluation. Your work could enable a highly flexible engineering solution for low-volume products without the long lead times and high costs typically associated with custom components.

Expected Activities

- Analyze cases where standard drum solutions are insufficient.
- Develop concepts for locally manufactured and 3D-printed drums.
- Evaluate material options and manufacturing methods.
- Assess strength, durability, and safety requirements.
- Compare production cost and lead time against traditional solutions.
- Define the practical limits regarding door size and weight.

Key Question: *Can locally produced custom drums provide a fast, affordable, and reliable solution when standard balancing components reach their limits?*



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Over Head Sectional Door
Next Gen. Control Unit: Electronics

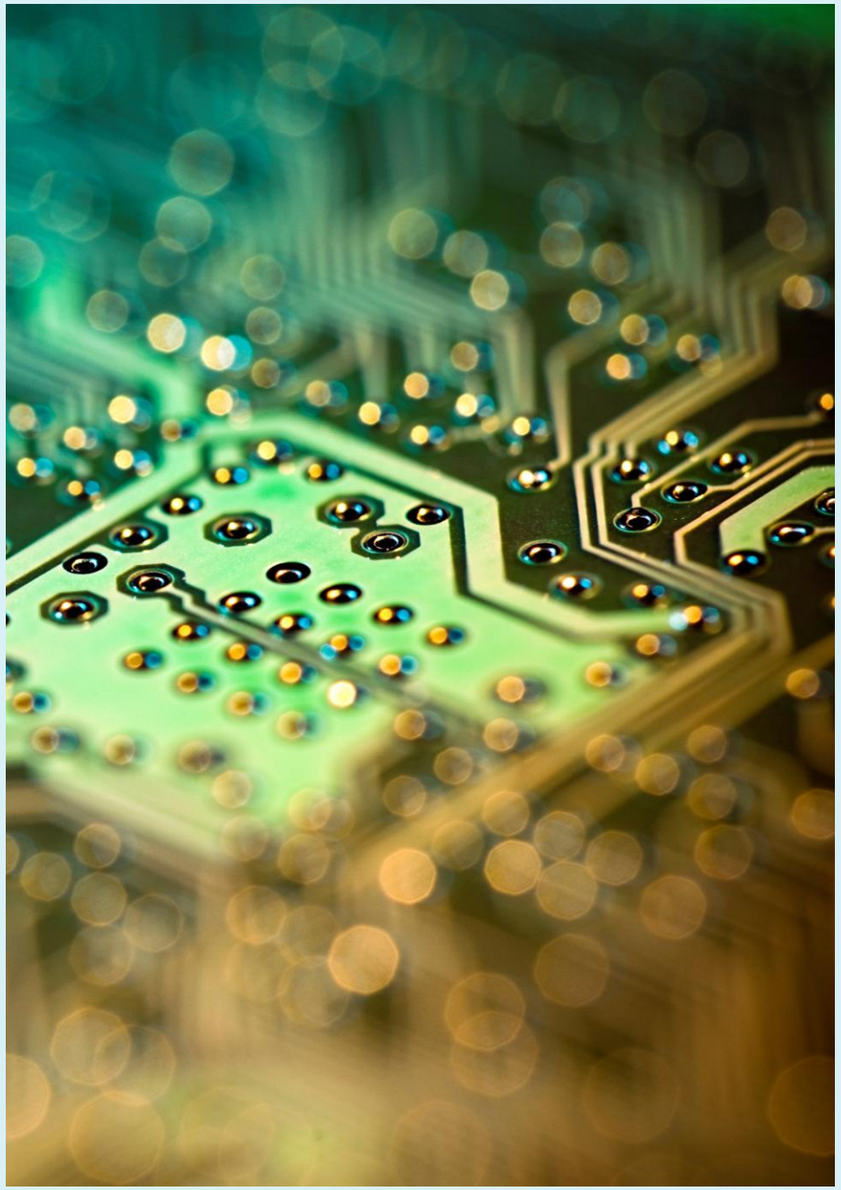
Today's control system is highly modular, but every additional feature comes with added hardware, complexity, and cost. Can we rethink the architecture from the ground up? By analyzing real product usage, future connectivity needs, and upcoming regulations, the goal is to create a smarter, more scalable control platform for the next generation of doors and loading bay equipment.

This thesis offers the opportunity to influence one of the most important systems in our products. Your work could define the electronics architecture used across future product generations while reducing cost, increasing flexibility, and simplifying development.

Expected Activities

- Analyze sales data to identify the most valuable built-in features.
- Gather requirements from stakeholders across the business.
- Challenge existing architecture and identify unnecessary complexity.
- Develop concepts for door and loading bay controller platforms.
- Evaluate module strategies that minimize base-unit cost.
- Investigate compatibility with current and future motor technologies.
- Ensure compliance with upcoming machinery regulations and connected-product requirements.

Key Question: *Can a next-generation control platform deliver more functionality, lower cost, and greater flexibility while remaining ready for the connected products of tomorrow?*



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Over Head Sectional Door AI-powered testing

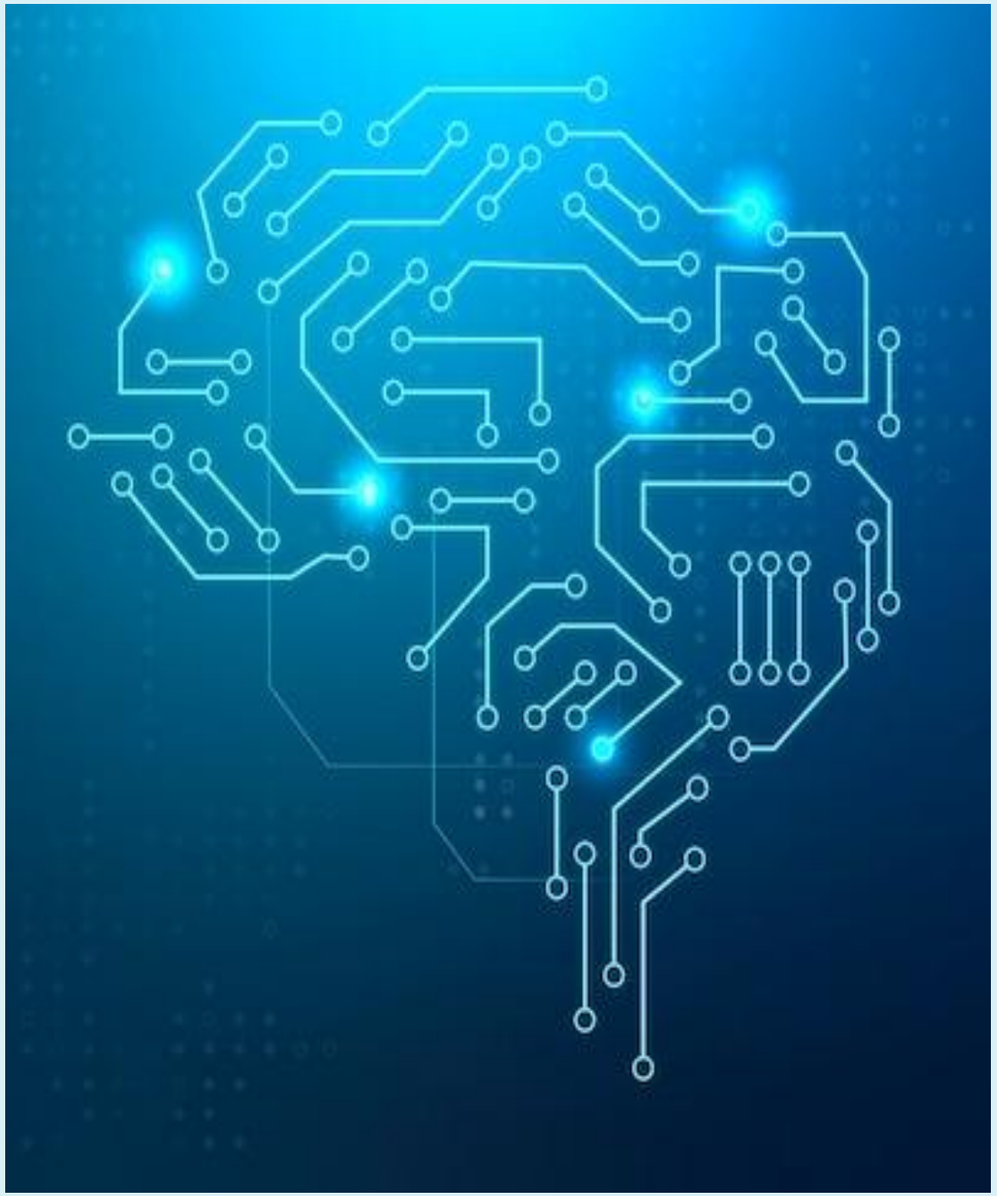
As our software grows in complexity, testing consumes an increasing amount of engineering time. Can AI help automate system testing, identify defects earlier, and enable fully automated overnight test campaigns? The goal is to understand how AI can support developers and testers while maintaining the reliability and safety expected from industrial door systems.

This thesis combines artificial intelligence, software engineering, and automation. Your work could help define the future testing strategy for our products, allowing engineers to focus on innovation while routine verification happens automatically.

Expected Activities

- Analyze the current software testing process and its limitations.
- Investigate how AI can generate, execute, and evaluate test cases.
- Develop concepts for autonomous overnight system testing.
- Identify software and architecture changes needed to support automation.
- Evaluate risks, limitations, and maintenance requirements.
- Create recommendations for a scalable AI-driven testing framework.

Key Question: *Can AI become a trusted test engineer, continuously validating our software while developers focus on creating the next generation of products?*



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18

Production Optimization Of New Folding Door Operator

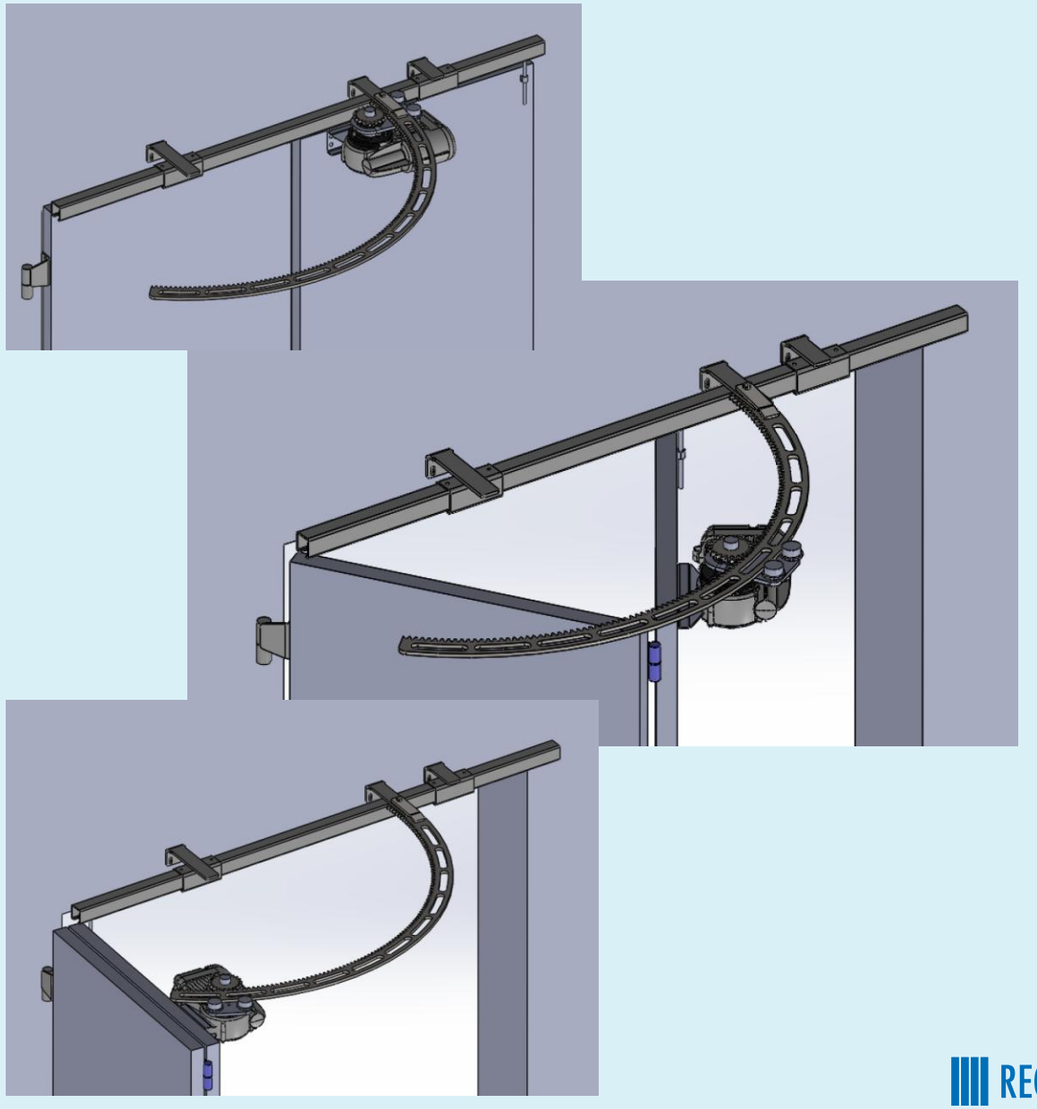
A few years ago, we developed and patented a new way to electrically operate our industrial folding doors using a rack and pinion drive. But the solution needs to be optimized to implement it in production.

This thesis aims to make the new operator concept produceable at a reasonable cost.

Expected Activities

- Find suitable manufacturing methods for the expected volume
- Adapt the “rack” design for the manufacturing methods
- Visiting our production in Lidköping
- Use FEM analysis and other simulations for quick testing
- Test using real prototypes to verify functionality

Key Question: *How do we optimize our new operator for production?*



Anders Löfgren / Lars Andersson

RECO PORT
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19

Panel Raising and Stacking Folding Door Panels

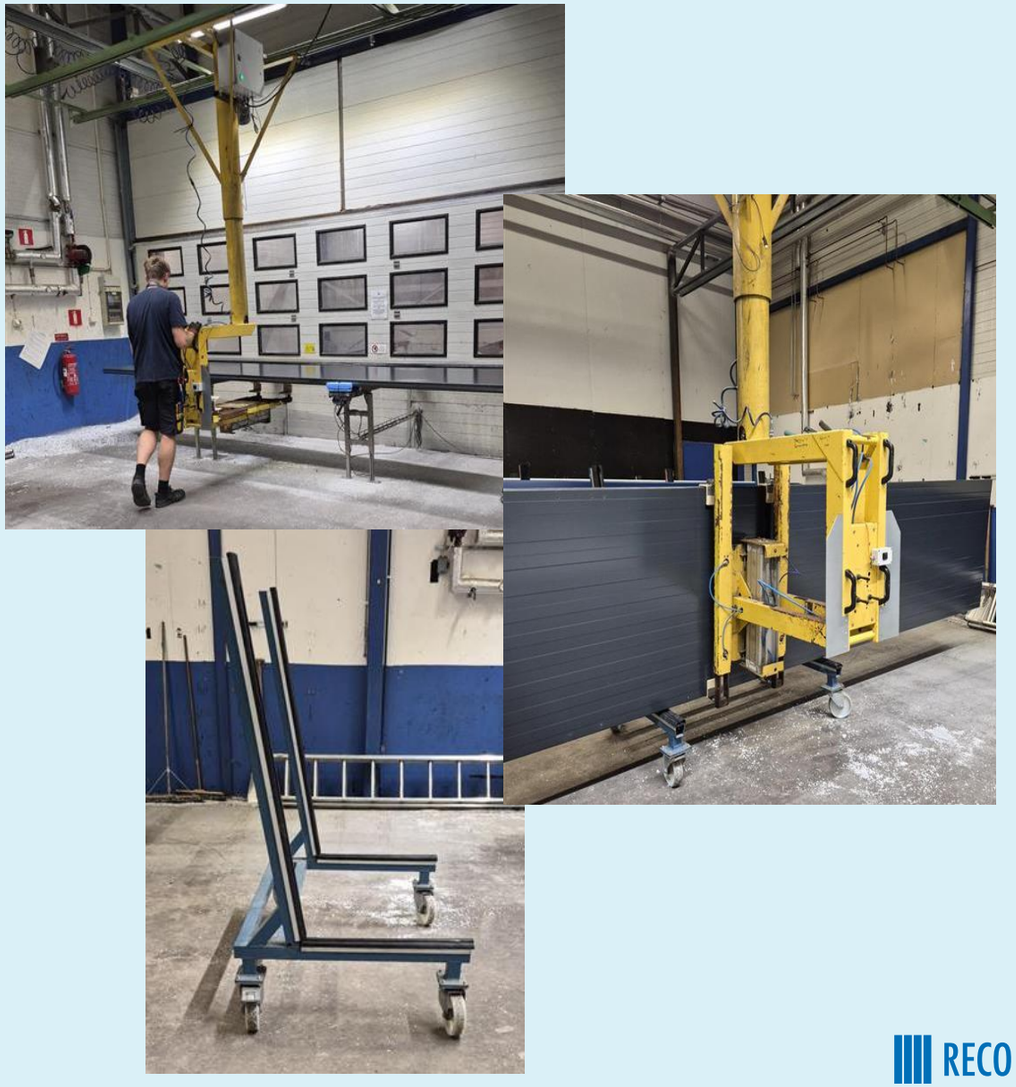
In our production facility in Lidköping we manufacture our folding doors. After the panel is glued, it is prepared for different hardware in our robotic drill and mill unit. Then the panels for one order are collected on a trolley standing vertically. Today this is done with a crane and a special gripper, but it is clumsy, slow and heavy.

We have a project in the “Applied mechatronics industrial project” course that is creating concepts for raising the panels from the conveyor to the trolley. This thesis is about developing, producing and implementing a machine based on those concepts

Expected Activities

- Evaluating solution concepts
- Making sure the machine works, which requires mechanical and electrical solutions
- Building the machine, which functions as its own prototype
- Programming the machine
- Ergonomic and usability analysis and testing
- Visiting our production in Lidköping

Key Question: *Building a machine to help with raising and stacking of folding door panels*



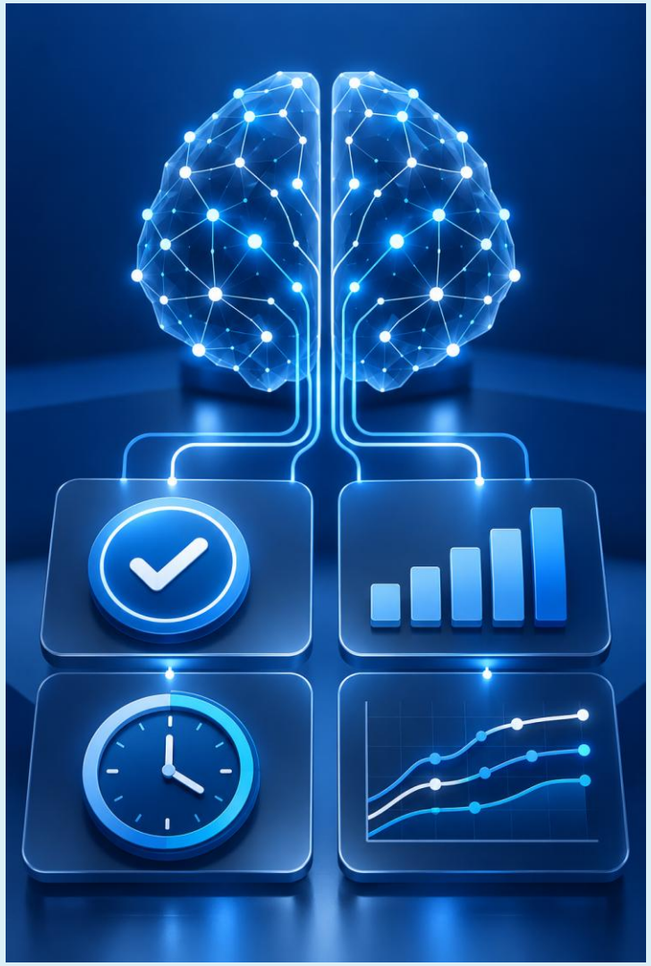
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Evaluation pipeline for AI models

Build a repeatable way to compare the models we use today, then test whether another evaluation method gives us a different or better view.

- Use and evaluate relevant AI components
- Define evaluation criteria, such as answer quality, cost, and latency
- Investigate and compare evaluation methods
- Build representative evaluation datasets
- Work in a cloud environment and develop an understanding of its services and capabilities
- Analyse and communicate the results



Ferenc Habony / (Joachim Albertsson)

21 Cost effective Document Intelligence

Find a reliable way to read business documents, then test which approach delivers the right information at the lowest practical total cost.

- Understand the cloud environment and its services
- Evaluate the current document-understanding solution
- Analyse accuracy, cost, and information gaps
- Compare alternative document-understanding approaches
- Explore improvements through tuning and training
- Recommend the most practical and cost-effective approach



Ferenc Habony / (Joachim Albertsson)

22 Can You Automate the Human Touch?

Our Hardware-in-the-Loop (HIL) test rigs can control advanced pedestrian door systems, but some test scenarios still require a person to push, pull, stop or position the door for swing and sliding doors.

Your mission, should you choose to accept it, is to automate that interaction.

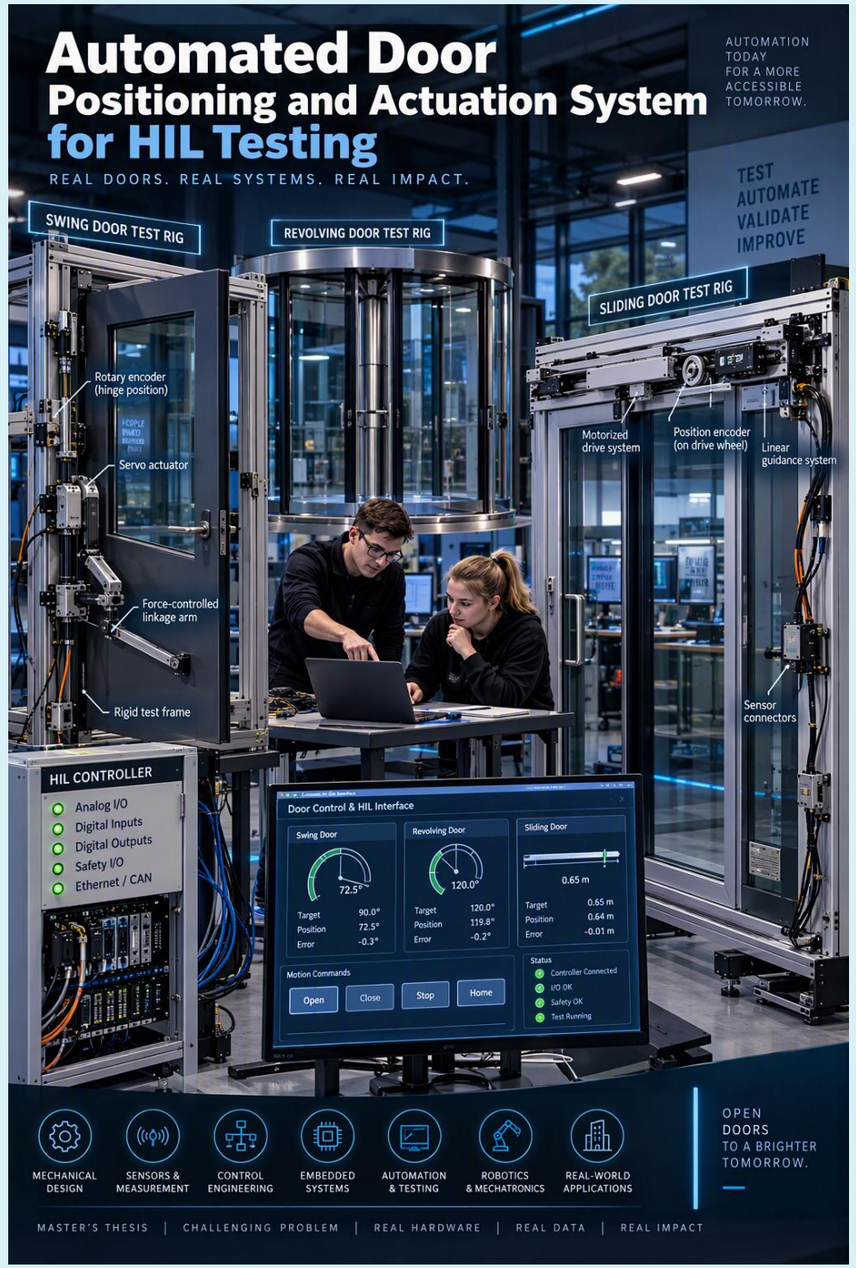
We are looking for Master's thesis students who want to design, build and validate a mechatronic system by combining mechanical design, control systems, sensors, software and automation.

- Push or pull a door to initiate opening or closing.
- Move the door to an exact predefined position before a test starts.
- Stop the door at any point during movement.
- Accurately measure and verify the door position.
- Hold the door in position and resist movement when required.
- Interface with existing HIL hardware using analog and digital I/O.

BUILD IT. CONTROL IT. TEST IT.

Apply individually, as a team, or team up across different engineering programs.

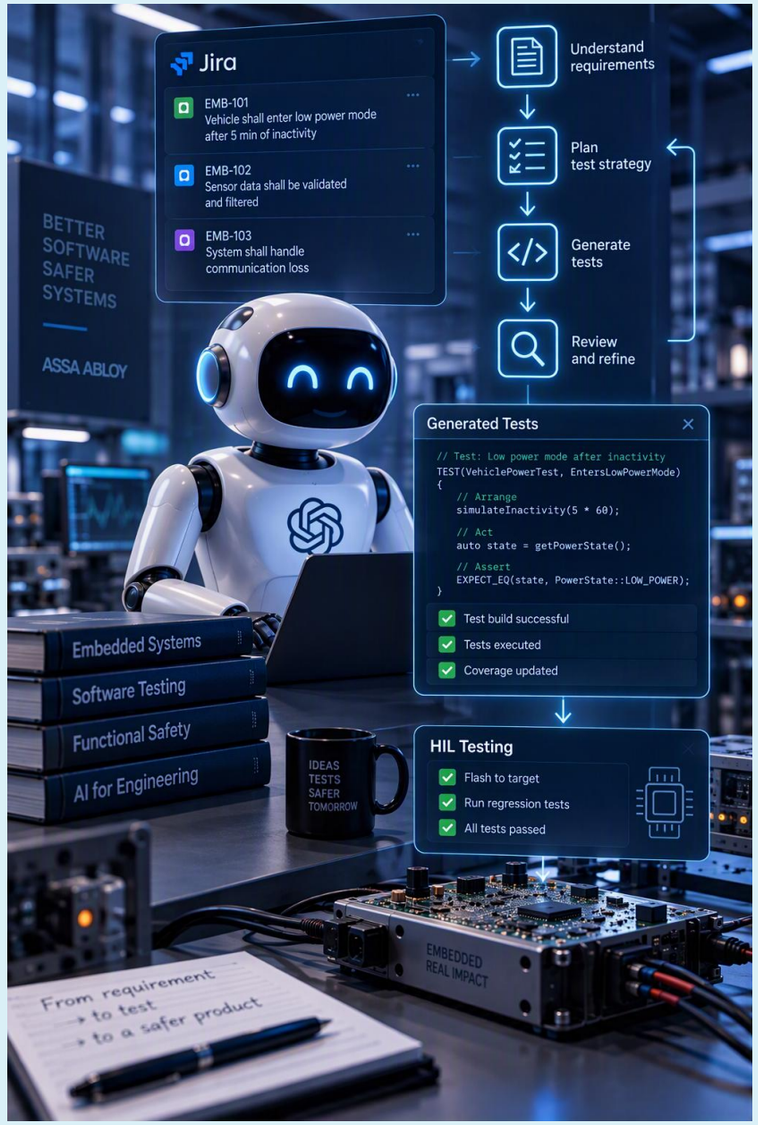
Eric Warnquist



Agent driven software development.

Investigate how AI agents can support embedded software development by generating and maintaining regression tests based on product requirements.

- Investigate how AI agents can leverage standardized tool interfaces to access requirements, source code and existing test assets.
- Generate regression test specifications and test code from requirements and code.
- Evaluate and compare the quality, coverage and maintainability of regression tests generated by different AI workflows.
- Deliver a complete workflow from Jira requirement to generated regression test running on real embedded hardware.



Roger Dreyer / Jonathan Vesterlund