

Transformation Hub Wiring Harness

Robotik Challenge 2025 - Organization and Experiences from the ARENA2036 Wire-Harness Challenge

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Workshop: Test before Invest! Reproducibility, Benchmarking and Competitions as enablers of technology transfer

ARENA2036

bayern  innovativ

OHLF OPEN HYBRID LABFACTORY

Getestet durch:
 Bundesministerium für Wirtschaft und Klimaschutz
aufgrund eines Beschlusses des Deutschen Bundestages

Objective of the Transformation Hub Wiring Harness

The transformation hub wiring harness is intended to link work from research and development with the practical needs of the industry for the development of relevant results.

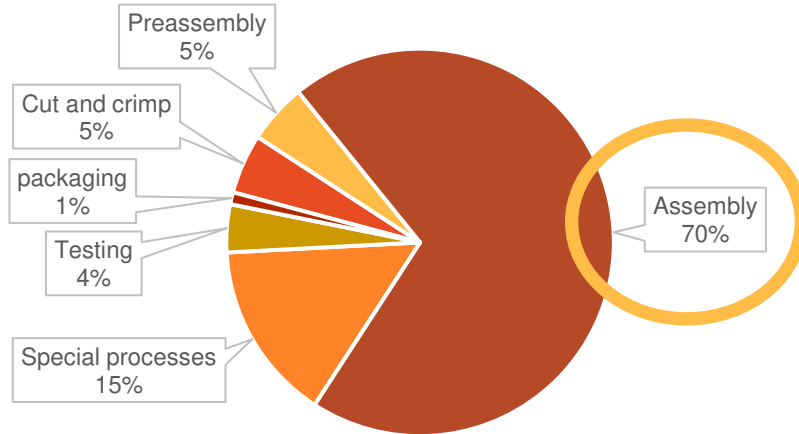
Functions of the Transformation Hub Wiring Harness

- **Hub function:** The wiring harness hub as a central point of contact for the industry and science for trends and future technologies
- **Bridging function:** Translating research topics and trends for implementation in practice and vice versa.
- **Support function:** Concrete support for the transformation is provided by initiating projects in both industry and research.

Consortium:

The logo for ARENA2036 consists of the word 'ARENA' in a bold, orange, sans-serif font, followed by the year '2036' in a black, sans-serif font.The logo for bayern innovativ features the word 'bayern' in a grey, lowercase, sans-serif font, followed by a blue circular icon containing a white stylized 'B', and the word 'innovativ' in a grey, lowercase, sans-serif font.The logo for OHLF OPEN HYBRID LABFACTORY features the letters 'OHLF' in a bold, sans-serif font, where 'O' and 'H' are white on a dark blue background, 'L' is orange, and 'F' is white on a dark blue background. To the right, the words 'OPEN HYBRID' are stacked above 'LABFACTORY' in a smaller, grey, sans-serif font.

Distribution of process time during cable harness assembly

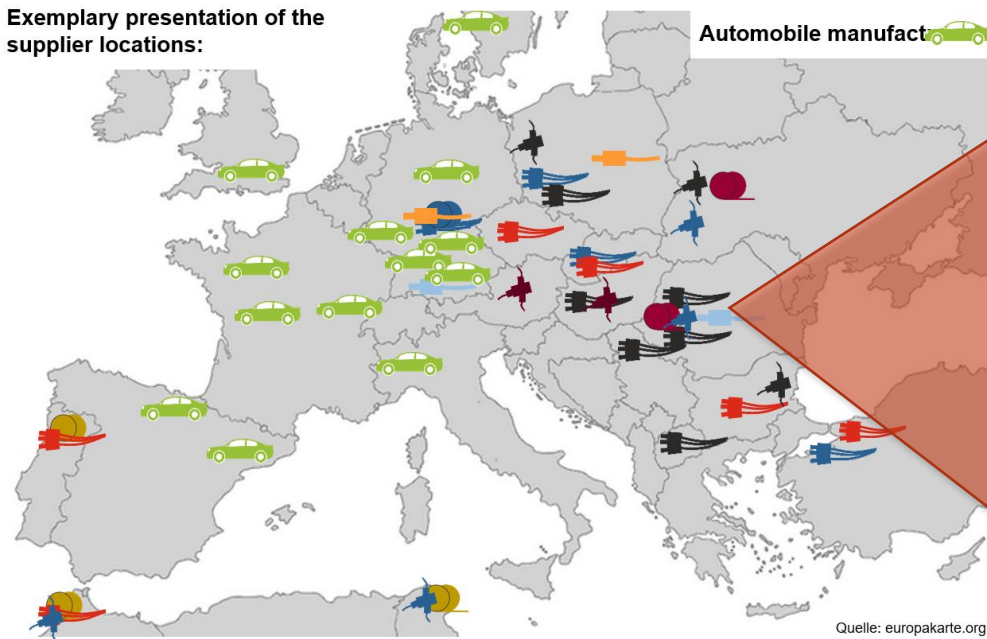


70% of the assembly process time is done manually. Hence the production locations are in best cost countries.

But:

- huge logistic effort.
- limited human resources
- political instability

Exemplary presentation of the supplier locations:



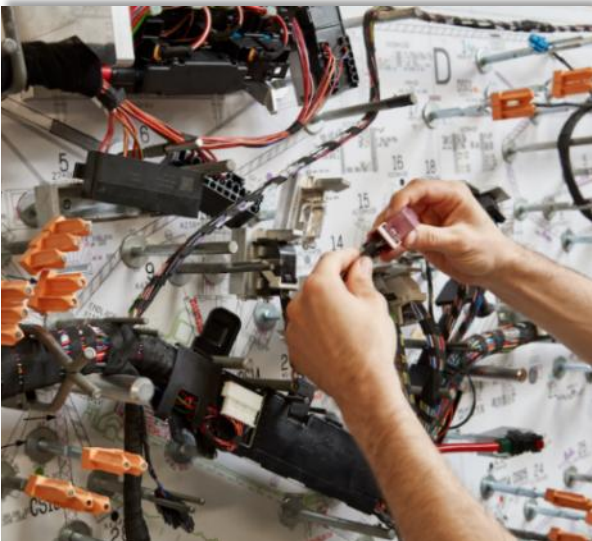
Source: LEONI

Requirements:

- Creation of an automated production process of a partial wire harness.
- Development of practice-relevant (partial) solutions that the assembly companies can potentially use in the context of a downstream implementation project with the solution provider.
- The target group are robotics system integrators with integration areas such as mechanics, control, sensors, cognition, learning ability, etc.
- The core task of the challenge is to map the cross-process handling of flexible parts.

Implementation procedure for the Robotik Challenge :

Step 1:
Analysis and task definition
Done by **LS-Hub**



Source: Kromberg und Schubert

Step 2:
Concept development
Done by **participant**

- Use AI
- Smart sensors
- Pattern recognition
- Data mining
- Construction
- Control Software
- Cobots
- Smart effectors
-

Step 3:
Realization
Done by **participant**



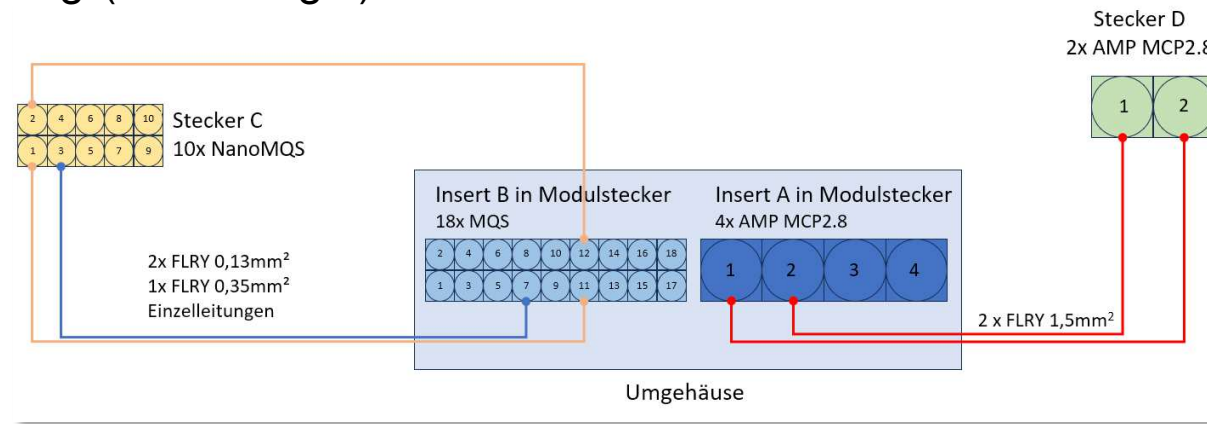
Source: FAU Erlangen-Nürnberg

Step 4:
Implementation by Tier 1
Done by **LS-Hub + participant**



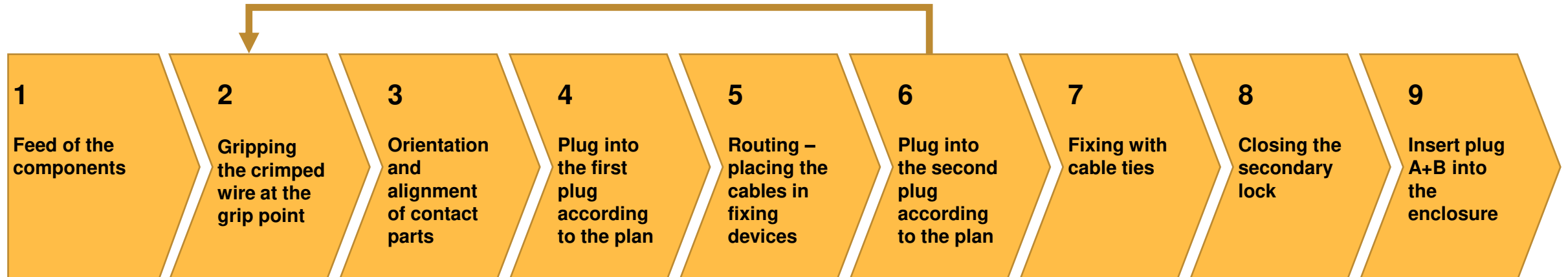
Source: LEONI

1. Determination of the wiring (electrologic):



2. Determination of the process chain:

Repeat steps 2 to 6 for all lines





Components for the wiring harness:

- 500 automotive wires
 - 400 connectors
 - 4 holder for the connectors
 - 1 unlock tool
 - 25 multicase for different connectors
- > enough to built 100 wirng harnesses

Additional Informations:

- CAD Data connectors and contact parts
- Manual for plug in NanoMQS Connectors

Gesponsert von:



Scope of delivery tool: cpk

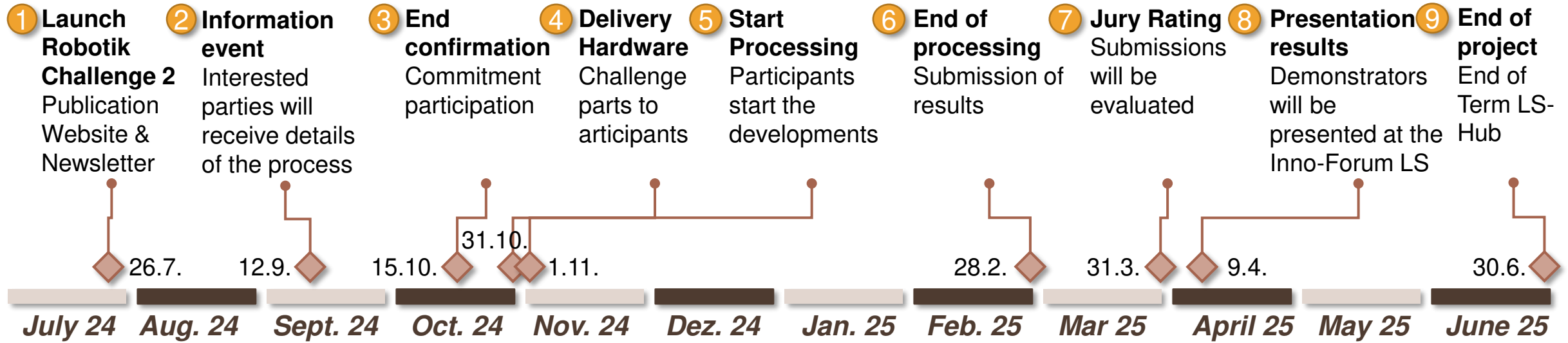
- Powered device
- 1000 Cable ties in magazines
- Robot Mounting Bracket

Fringe benefits:

- 2 Training sessions with experts
- CAD – Data
- Controll software
- Programming advise
- Manuals
- Service

Bereitgestellt von: **HellermannTyton**






Roadmap and next steps of the Robotics Challenge



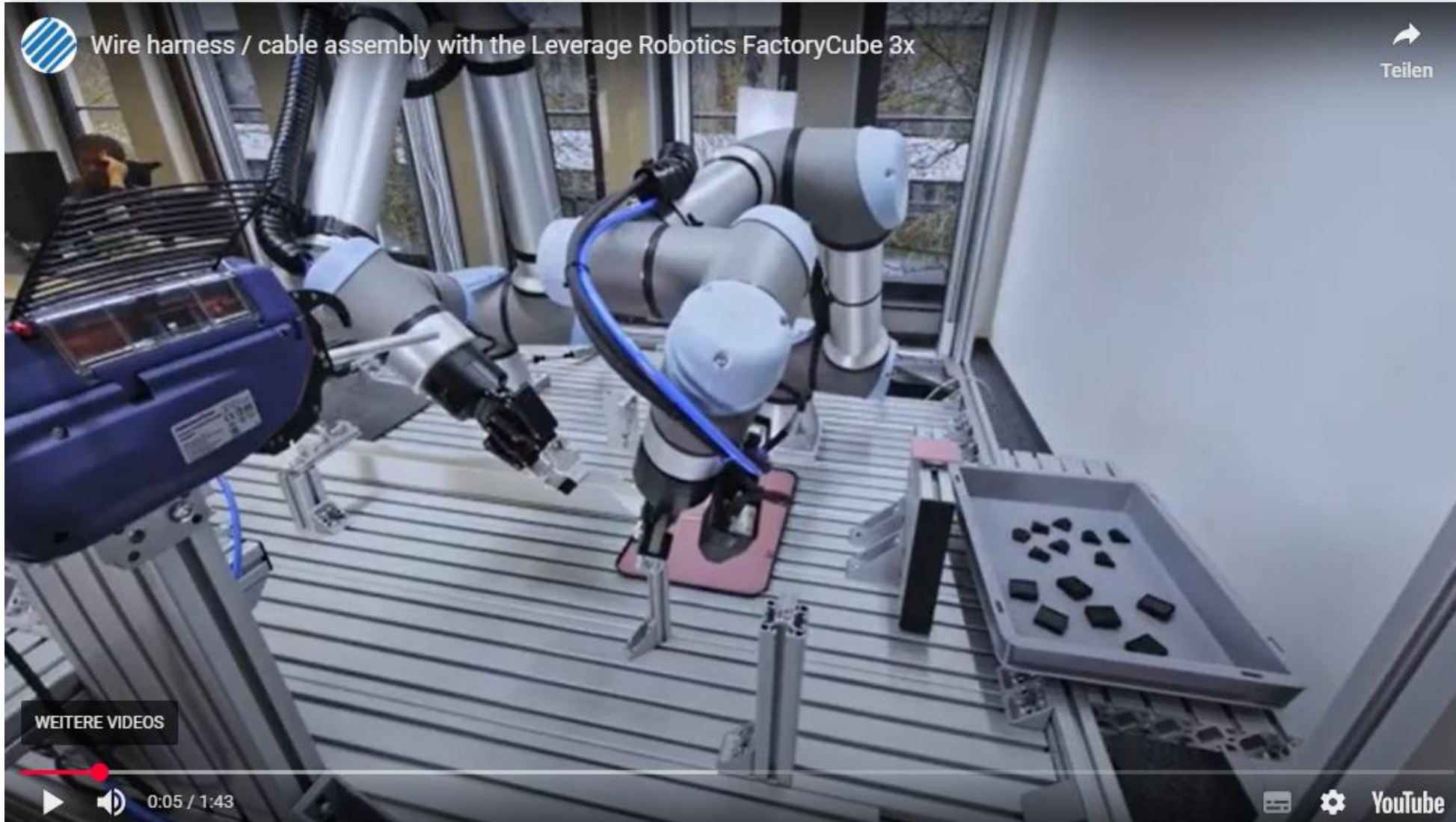
Schedule:

- *Launch der Challenge /* : 26.07.2024
- *Information event:* 30.09.2024
- *End of login:* 15.10.2024 prolonged bis 1.11.2024
- *Shipping Hardware:* bis 11.11.2024
- *Start processing:* 01.11.2024
- *End Processing:* 28.02.2024
- *Rating results / Jury-meetings:* bis 31.03.2024
- *Presentation of the results/ of the demonstrators at the Innovation Forum* 09.04.2024

- When recruiting participants, 44 companies and organizations from the field of special machine construction, sensor technology and robotics throughout Germany were addressed.
- 5 participants have registered, of which 2 are companies and 3 are research institutions. The work began on 1.11.2024. The participants are:

Name	Location	Typ	Emphasis	
Agile Robots	München (D)	Company	Robotic based assembly	
Friedrich Alexander Universität - FAPS	Nürnberg (D)	Institute	Robotic based assembly	
Universität Stuttgart - ISW	Stuttgart (D)	Institute	Intelligent wire routing	
Leverage Robotics	Oberpfaffenhofen (D)	Company	Collaborating robotics	
THWS	Schweinfurt (D)	Institute	Collaborating robotics	

Example: Leverage Robotics



- Results of the Participants:
- Movie
 - Demonstrator

Jury consists of 7 experts from the industry.

- 3 Awards:
- Innovation and technology
 - Reliability and process stability
 - Economic aspects and transformation

Robotik Challenge



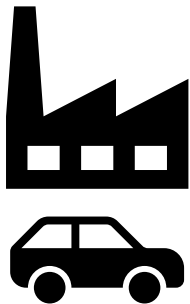
Innovationsforum



Deep Dives

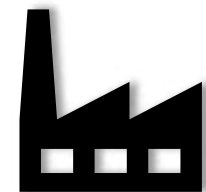
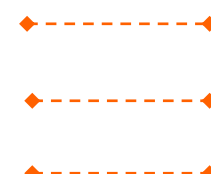
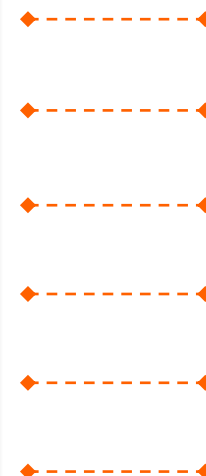


Fast Access Projects



Consideration and introduction of the demonstrators and discussion between

- Robotic supplier
- OEM
- Wiring harness companies



➤ Transfer of the crucial point in automation production from the industry into the Robotik Challenge

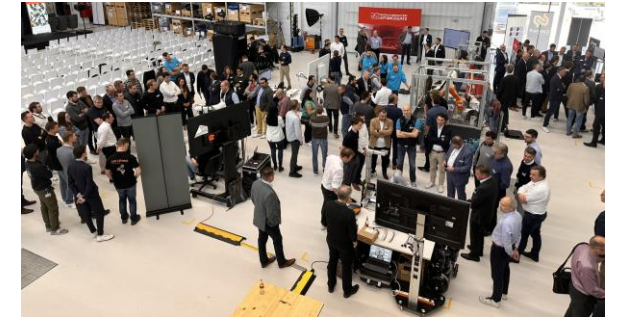
➤ Opening field of Ideas for concrete use cases in the production chain of the industry

➤ Transfer Hub supports the bilaterally Follow-Ups projects with consulting issues

➤ Realisation Proof of Concept in the ARENA2036 or directly in the Company

Follow Up Process - Robotics Challenge

- The base for the Follow Up Process is the Event “Innovationsforum” on the 9th April 2025 at the Building ARENA2036/ Stuttgart were a great number of visitors from the group of OEM, Robotic supplier and wiring harness manufacturer are expected.
- A requirement for a successful Follow Up Process is that the visitors check in their companies specific demands in their production facility for technical optimization potential before the will come to the event.
- At the Event all the participating teams will introduce their solutions in detail to the visitors by a technical tour. This is the first possibility for the visitors to check the usability of the exhibit robotic devices.
- Visitors with specific questions can have a separate table where they can discuss their topics at that day with the participants.
- After three weeks after the event visitors appreciate to come together and discuss their experience what they got in their internal investigation for the use of the results of the Robotic challenge.
- The aim is to determine the usability of the technologies from the Robotics Challenge in the ecosystems of the assembly companies.
- Picking up on results from selected RC participants with the greatest probability of realization.
- Following the Robotics Challenge, partnerships will be formed between RC participants and Tier 1 for implementation and further development with the support from LS-Hub.
- Preparation of non-public implementation projects that are worked on in cooperation with partners.



Bilder: ARENA2036

Presentation of the results of the Robotics Challenge in the ARENA2036

Highlights Event:

- **Experience Robotic-Solutions of the wiring harness :** Results of the Robotics Challenge 2025 and new approaches to automating harness production with **Live demonstrations of the prototypes.**
- **Specialist lectures and discussions that shed light on trends and challenges.**
- **Networking opportunities to exchange ideas with experts and industry representatives and to make contacts for future collaborations.**



Further information and free registration:

www.leitungssatz-hub.de

Thank you for
your attention!

