CATALOG OF LABORATORIES

INDUSTRY 4.0

The project “Networking Czech and Austrian Testbeds for Industry 4.0” (TESTBED EXCHANGE) within the framework of OP Interreg V-A Austria - Czech Republic aims to, to connect expert workplaces focusing on Industry 4.0 and the digitalisation of production from the border regions of the Czech Republic and Austria. These workplaces, the so-called testbeds, are located mainly at universities in both countries and thus have both sufficient theoretical knowledge of the issue and the necessary technical equipment.

The main objective of the project was to create a network of testbeds that would connect these workplaces both by professional proximity and by personal contacts of scientific and technical staff. The purpose of this network is to exchange knowledge and experience in the field of digitization and Industry 4.0 and to develop mutual cooperation in follow-up projects. An integral part of the project is also the education of the professional and general public and students of participating universities, which was implemented through a series of online seminars focused on individual chapters of the mentioned issues, such as collaborative robotics or digital twin. The recordings of these seminars are available on the project website.

Project partners:

College of Polytechnics Jihlava
Verein Industrie 4.0 Österreich – die Plattform für inteligente Produktion

EUROPEAN UNION

Interreg
Austria-Czech Republic
European Regional Development Fund

V Š P J
Vysoká škola polytechnická Jihlava

INDUSTRIE 4.0
AUSTRIA

Learning, innovation and demonstration factory for Smart Production and Cyber-Physical production systems

Focus on multi variant serial production in the field of discrete manufacturing

This infrastructure offers small and medium sized companies particular low-thresholdaccess to Industry 4.0 topics

TU Wien Pilotfactory Industry 4.0

EDUCATION

- Training courses in the academic field and lifelong learningon the job
- Laboratory for courses on process- and product development, cyberphysical assistance systems and robotics

RESEARCH

- On Large production machines for subtractive and additivemetal processing
- Development of required IT hardware and software for the automatization and digitalization of production processes
- Topics on Industrial robots, collaborative robots and automatedguided vehicles

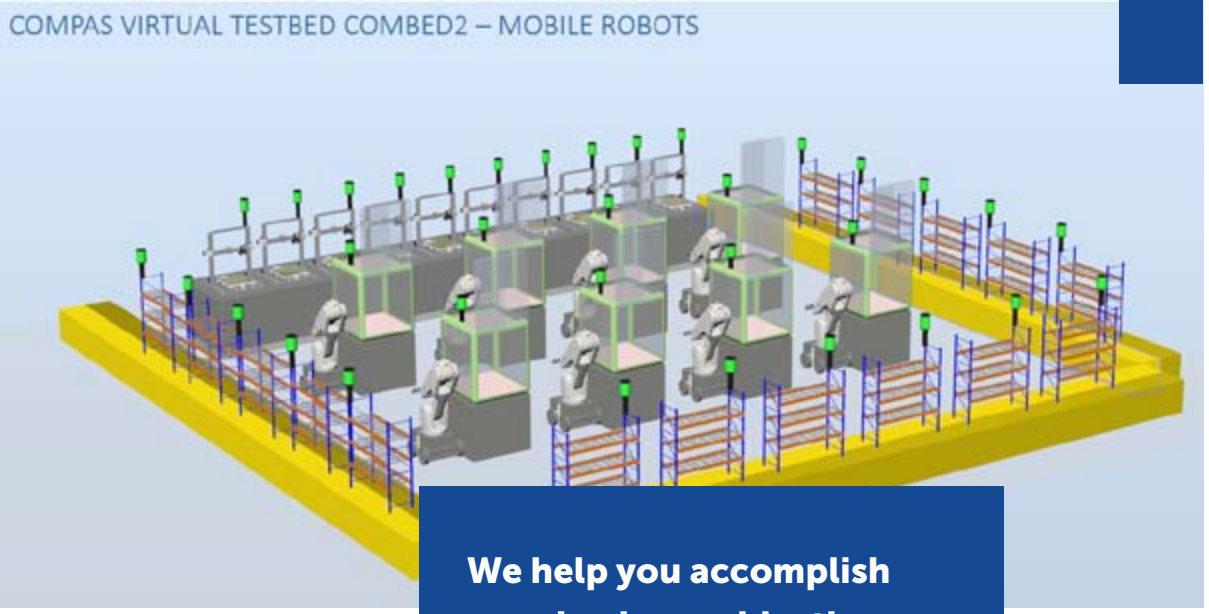
INDUSTRY COOPERATION

- In addition to the existing demonstrators, new use cases are constantly being developed with industry partners in throughout 20 parallel research topics each year
- Regularly updated and supplemented infrastructure

TU WIEN

- Conducting research under the motto „technology for people“
- Combines basic and applied research and research oriented teaching
- Our members help to stimulate Austria‘s innovative potential

TU WIEN Pilotfactory Industry 4.0



We help you accomplish your business objectives in production. Our solutions bring modern information and control systems that significantly increase the competitiveness of your business.

Compas Automation – Virtual testbed Comber

ABOUT US

Compas was established in 1990 and over time has become a leading Czech engineering company that deals with the automation of manufacturing technologies (technological processes, machines, lines and equipment) and plant manufacturing optimization systems (MES/MOM).

We have supplemented our activities with the construction and supply of machines and equipment with robots, thus fulfilling our vision of a comprehensive supplier of investment units with systems integrated from automation to ERP systems for factories.

FOCUS ON INDUSTRY 4.0

The international two-years research project RACAS of team of German partners OvGU Magdeburg and Timap Berlin and Czech partners VUT Brno and COMPAS created a demonstration in the form of a case study to demonstrate the development of smart manufacturing based on Industrie 4.0 standards, I4.0 component model, the AAS version 1.0 and AAS in Detail specifications.

MAIN OBJECTIVES

- Complete solution of factory automation and production information systems (MES systems)
- High quality of deliveries
- Use of global standards
- Professional service

OUR VALUES

- Satisfying customers' need
- Innovation, cleverness and creativity
- Continuous growth of quality
- Respect to people, safety risk prevention

COMPAS AUTOMATIZACE

State-of-the-art lab infrastructure for learning and scientific study of advanced manufacturing planning, control and automation concepts

Automated production line based on a FESTO Didactics FMS 50 system including light and induction sensors, RFID read and write heads, intelligent camera systems, pneumatic and electric linear and circular drives, handling robot, various conveyor systems, programmable logic controllers, simulation software

Production Order Management and Execution System

Smart Material Test Stand

Factory Lab FH Wiener Neustadt
Research and Learning Factory

EDUCATION

- Automation and production planning and control concepts
- Intelligent automation and AI applications
- Materials handling and conveyor technologies
- Work and material flow optimizatio

RESEARCH

- Data management and AI application in production lines
- Flexibility in multi-model/mixed-volume production

INDUSTRY COOPERATION

- Regional SMEs, FESTO, SICK, BOSCH-REXROTH
- Platfform I4.0, EIT Manufacturing

THE INSTITUTE OF INDUSTRIAL ENGINEERING AND MANAGEMENT

- Research and education in Design and Optimization of production systems
- 6 Employees, 2 Labs

THE UNIVERSITY OF APPLIED SCIENCE IN WIENER NEUSTADT

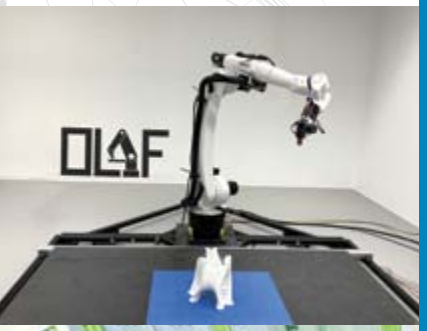
- 4500 students in 44 Bachelor's and Master's degree programs
- 4 Campuses, 400 Employees

FACHHOCHSCHULE
WIENER NEUSTADT
University of Applied Sciences - Austria

Industrial Scale Polymer Processing Equipment

Focus on digitalization and digital transformation along the whole value chain in polymer processing

Possibility to implement funded or non-funded research projects



LIT Factory at the Johannes Kepler University (JKU) in Linz

EDUCATION

- Support education in JKUs Bachelor, Master and Doctoral Programs including Bac., Msc. and PhD Thesis
- Training programs in the field of polymer processing, recycling and digital transformation from apprentices to top level management

RESEARCH

- Development of digital models, shadows and twins for processing equipment
- Using AI to setup assistance system for processing machinery
- Apply novel non-destructive testing for thermoplastic components
- Production and recycling of thermoplastic fibre reinforced components
- Recycling of plastics
- Digital transformation along the value chain in polymer processing

INDUSTRY COOPERATION

- Test before Invest activities
- Funded and non-funded research projects

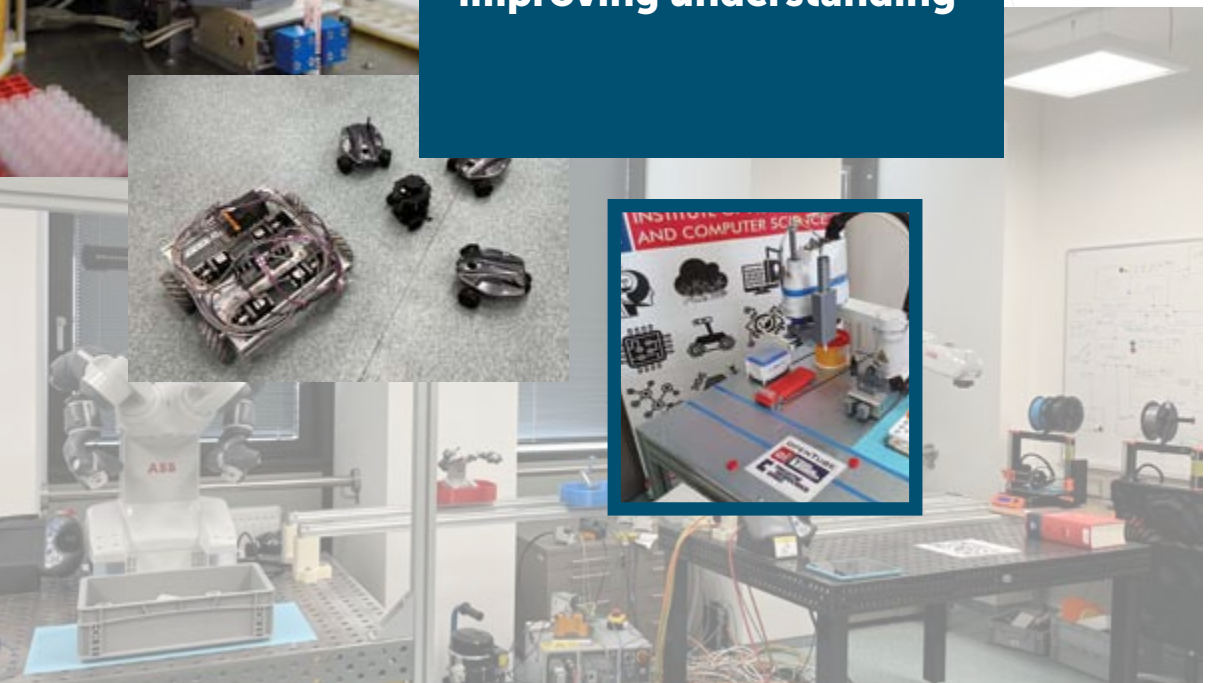
JKU

- Deep roots and a strong legacy in the region
- International activities
- Anchored as part of society and the local business community
- Excellent employees
- Innovation through interdisciplinary practices
- Real-world practices integrated in to teaching and research
- Strong campus culture

JKU
LIT Factory

Advanced Robotic Cell based on the Industry 4.0 Concept

Adaptability to future automation technologies in various fields, improving understanding



Industry 4.0 Cell (I4C) at the Institute of Automation and Computer Science, FME, BUT

EDUCATION

- Transforms theoretical knowledge into practical applications in the real world.
- Use of modern technologies in the educational process, such as ROS, GitHub, ABB RobotStudio, B&R Automation Studion, OpenAI and much more.
- Cisco Networking Academy and electrical certification according to Decree 50/1978 Coll.
- Offers different levels of study, such as bachelor's, master's and doctoral degrees.

RESEARCH

- Solving the main pillars of the Industry 4.0 concept, such as autonomous robotics, artificial intelligence, digital twins, system integration and more.
- The ability to effectively solve complex engineering problems such as versatile intelligent robotics, advanced robotics in healthcare, machine perception and mobile robotics, which includes bio-inspired robotics.

INDUSTRY COOPERATION

- Research and development is supported by cooperation with several industrial partners such as SMC Industrial Automation, ABB Robotics and B&R Automation.
- Consultation and assistance to industrial companies on problem solving and understanding the concept of Industry 4.0.

INSTITUTE OF AUTOMATION AND COMPUTER SCIENCE

- Part of the Faculty of Mechanical Engineering, Brno University of Technology.
- The versatility of the institute, which includes the study of automation, computer science and computer networks, is the basic for understanding Industry 4.0.
- A strong history in artificial intelligence and machine learning techniques.

FACULTY OF MECHANICAL ENGINEERING
institute of automation and computer science

Three laboratories on one site: Industry 4.0, Maker and Electronics Lab

Educational and Research projects are done in the Laboratories

Modern state-of-the-art equipment (Cobots, AR/VR, simulations)

Industry 4.0 Laboratory at the St. Pölten University of Applied Sciences

EDUCATION

- Teaching and knowledge transfer in the fields of Industry 4.0, Asset Tracking. AR/VR, Rapid prototyping and electronics
- Students can work on modern state-of-the-art equipment: Cobots, Simulation tools, AR and VR glasses, 3D Printers and a Laser cutter
- Environment for practically tryouts in robotics, industrial automation and programming
- Didactical designed learning and training installations
- Practical assistance on bachelor - and master theses

RESEARCH

- Development and testing of asset tracking approaches using several technologies (e.g. RFID, UWB, GPS, Bluetooth)
- Applications in the field of computer vision and machine-learning based image processing
- Research in the field of Sensor Fusion
- Integration of Human Machine Interaction (HMI) into processes and applications

INDUSTRY COOPERATION

- TRAAK 4.0 – Asset tracking in Industry
- Impact XR – Augmented and Virtual Reality in Industry
- Workshops for SMEs

ifh st.pölten

A workplace demonstrating the principle of fully distributed production control based on a multi-agent system

Industry 4.0 Laboratory and Testbed at the Faculty of Electrical Engineering and Communication, Brno University of Technology

EDUCATION

- Industrial automation - components, control systems (Siemens and Beckhoff) and modern technologies
- Embedded systems - MCU programming and PCB desig
- State-of-the-art design, virtual simulation and commissioning of machines and production lines
- Industrial communications - fieldbuses, industrial ethernet, and OPC-UA

RESEARCH

- Asset Administration Shell - desing and implementation
- Centralized and distributed production scheduling methods
- Predictive maintenance

INDUSTRY COOPERATION

- IoT systems - data collection and transmission using edge devices, cloud services and data presentation
- PLC-based control systems
- MCU-based embedded system design and implementation

BRNO UNIVERSITY OF TECHNOLOGY
FACULTY OF ELECTRICAL ENGINEERING AND COMMUNICATION

UVSSR CELL is production system focused on the machine tool accuracy improvement, virtual commissioning and AR / VR.

UVSSR PORTABLE CELL is mostly focusing on AR / VR using inhouse developed technology AROS (Augmented reality operator support)

Institute of production machines, systems and robotics, BUT Brno

EDUCATION

- Industrial robotics and automation
- Virtual commissioning
- Machine tool operating
- Machine tool accuracy measuring

RESEARCH

- AR / VR application for industrial application
- Machine tool accuracy improvement
- Robotic machining

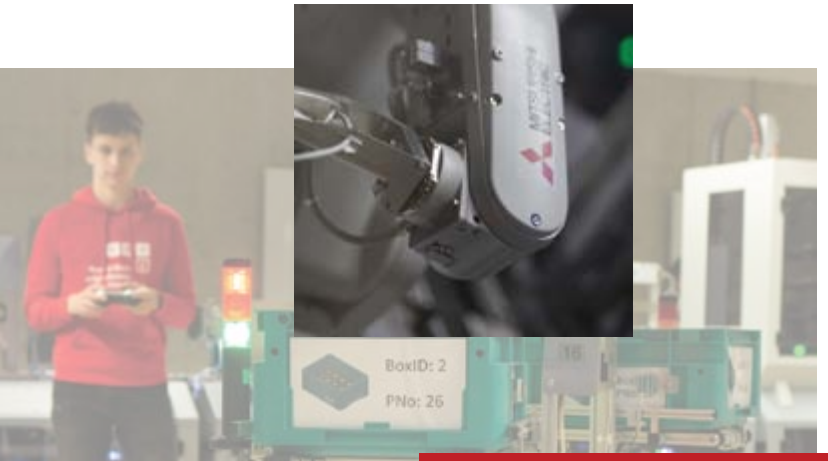
INDUSTRY COOPERATION

- AROS implementation (AR/VR)
- Machine tools accuracy improvement implementation

INSTITUTE OF PRODUCTION MACHINES, SYSTEMS AND ROBOTICS

- Institute is located on the Faculty of Mechanical Engineering, Brno University of Technology
- Including multiple departments (Production Machines, Systems, Robots, Manufacturing Systems and Virtual Reality, Electrical Engineering, Quality, Reliability and Safety)

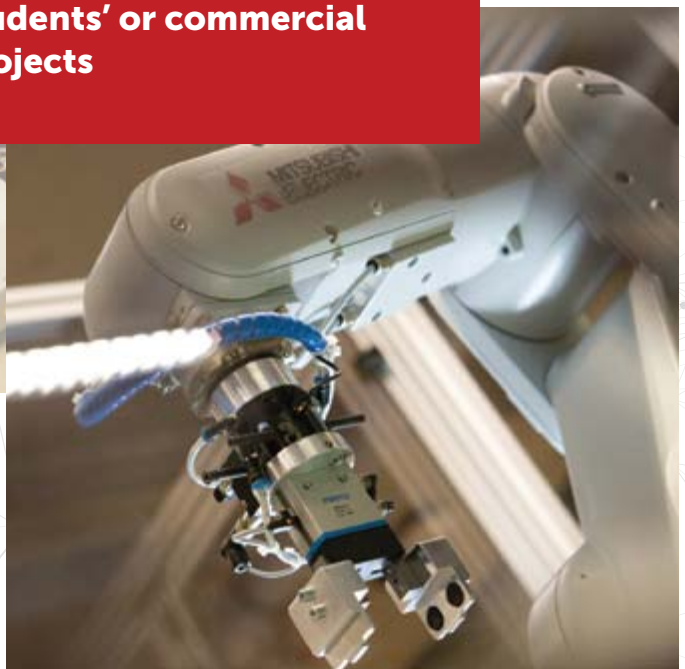
FACULTY OF MECHANICAL ENGINEERING
institute of production machines, systems and robotics



Modern laboratory for teaching Industry 4.0 technologies

The equipment based on real industry components and technologies

Possibility to implement students' or commercial projects



Industry 4.0 Laboratory at the College of Polytechnics Jihlava

EDUCATION

- Environment for teaching robotics, industrial automation and programming
- Using modern technologies such as OPC UA, PLC Simatic, WinCC, RT Toolbox 3 etc.
- Virtual modeling and simulation of production processes
- Using autonomous, mobile robots Robotino
- Opportunities for bachelor and master thesis topics

RESEARCH

- Implementing AAS principles into the real industry process
- Using virtual simulation for optimizing a robot's movement

INDUSTRY COOPERATION

- Designing automated industrial systems
- Cooperation on the digitization of industrial enterprises

THE COLLEGE OF POLYTECHNICS JIHLAVA

- University study with strong practical orientation
- Numerous technical and humanities study programmes
- Supporting education and development of the Vysočina Region

V Š P J

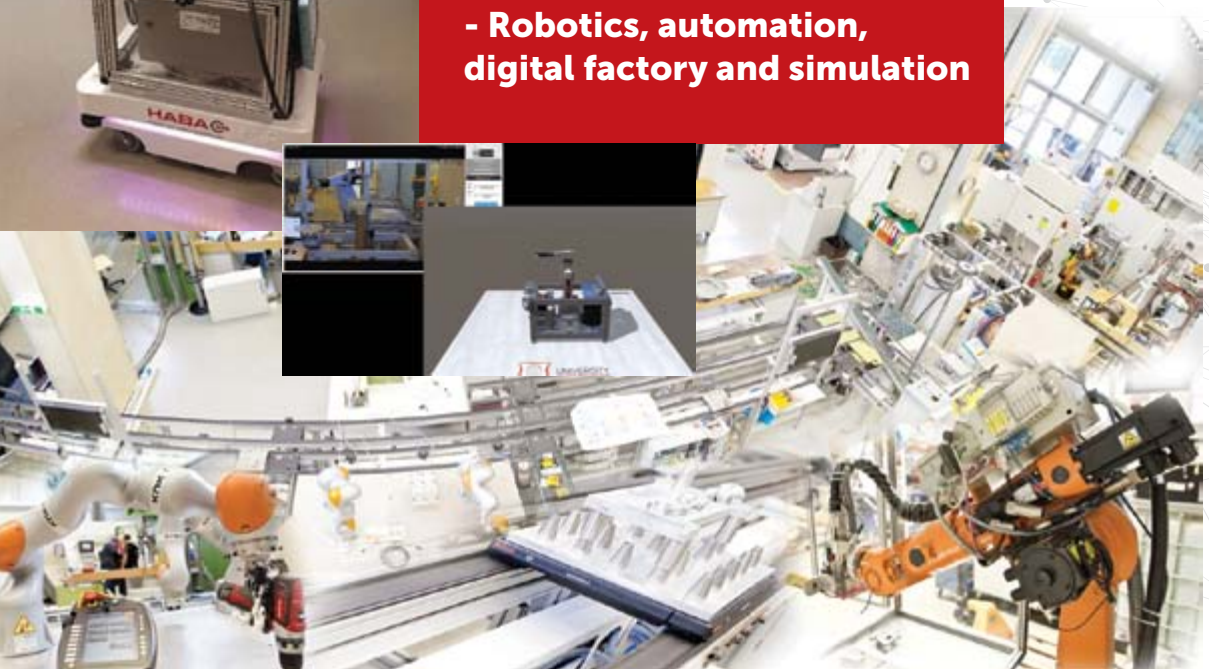
Vysoká škola polytechnická Jihlava

CSM is an industry-oriented, teaching laboratory, focusing on the following areas:

- Additive Manufacturing and Forming Technology

- Machining technology and machine tools

- Robotics, automation, digital factory and simulation



CSM on the FH OOE Campus Wels

EDUCATION - MAIN TOPICS OF STUDY:

- Digital Factory and Digital Twin
- Robotics
- 3D printing and additive manufacturing
- Intelligent manufacturing
- AR/VR
- Workshops for schools - robotics, digital twin, AV/VR
- Lifelong learning - robotics, metrology, programming, control technology

RESEARCH

- Automated control techniques and simulations
- Innovation and technology management
- Energy and Environment
- Food technology and biotechnology
- Measurement and Testing Technology
- Materials and Manufacturing Engineering

INDUSTRY COOPERATION - MAIN TOPICS:

- Autonomous driving
- Collaborative Robotics
- Virtual commissioning of industrial equipment

Many students work on their bachelor's and master's theses in collaboration with industrial companies

FF OOH CAMPUS WELS

- One of the first universities of applied sciences in Austria
- More than 100 full-time scientific staff
- New, modern campus

fh OBERÖSTERREICH UNIVERSITY OF APPLIED SCIENCES UPPER AUSTRIA

TECHNIKUM DIGITAL FACTORY

The Technikum Digital Factroy (TDF) at the University of Applied Sciences is a R&D facility focused on exploring technology trends in the context of Industry 4.0 and flexible production systems. Concepts for intelligent production environments are implemented using a wide variety of technologies and state-of-the-art equipment.
The main focus is on researching requirements for the flexible, efficient and intelligent production systems.

FH Technikum Wien

EDUCATION

- Many Bachelors and Masters study programs
- Computer sciences and Applied mathematics
- Electronic engineering
- Industrial engineering
- Life Sciences engineering

INDUSTRY COOPERATION

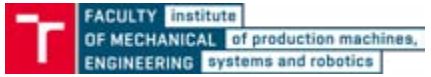
We offer industry companies the following learning formats:

- Info and introductory events and open lab walks, especially for "non-technical" people such as HR, legal, marketing & PR.
- Interactive and practice-oriented, specific seminars for specialists and managers in industry in customized formats
- Innovative learning and teaching projects in a modern laboratory context
- Apprenticeship training: With our miniature factory, we also come to companies directly.
- We are happy to advise on customized training in companies.

RESEARCH AREAS

- Robot-based Automation
- Robot Safety
- Robot-based Machining
- Human-Robot-Collaboration
- Autonomous Robots

Technikum
Digital
Factory



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