EWA Young Talent Award

Poster Guidline

A poster is a method on which researchers, students, etc. can present their research or project in an event, which combines written and visual elements to present verbally the results. It is about identifying the core of ones' research/project in order to present it.

Planning a poster

Designing a poster can be tricky. Our advice is to first be clear on the content and then focus on its visual presentation. You will find many online sources offering guidance on this topic, so we do encourage you to explore these!

Nevertheless, here a few guiding questions regarding the content:

- What is the big picture i.e. industry, sustainability? How does your project relate to it?
- What is the question or problem you explored?
- What strategy did you employ to solve your problem or answer your question? (methods, materials, methodology)
- What were your results?
- Why are these results significant in terms of the big picture? What is your interpretation?
- What are your recommendations and/or lessons learned?

Do not forget to include:

- The name/title of your project
- Your name/group members
- Professor supervisor(s)
- Company supervisor(s)
- Logo of the supporting company
- Logo of you institution

Structure of a poster

There are different ways of structuring a poster. Most importantly, there has to be a logical structure to! It is crucial that the audience can easily recognize its flow and identify information. Do not forget that it should be understood by someone who does not know the project and subject.
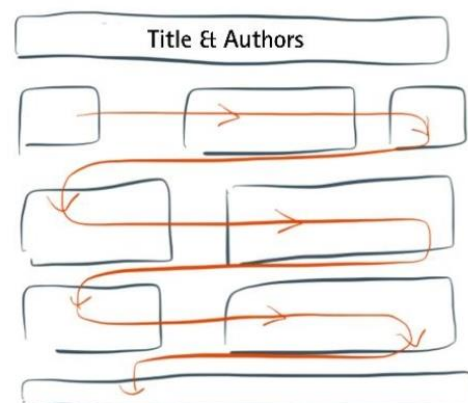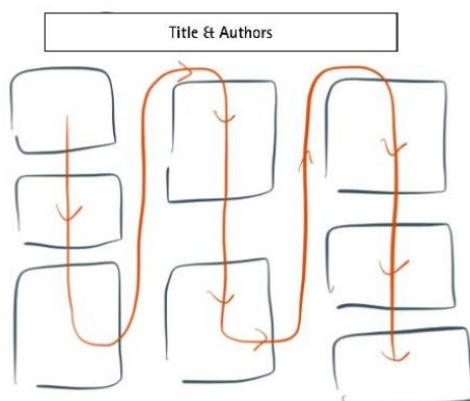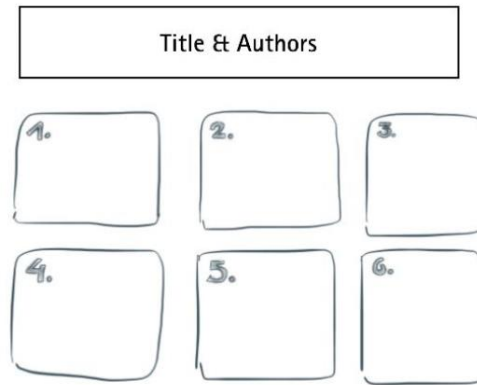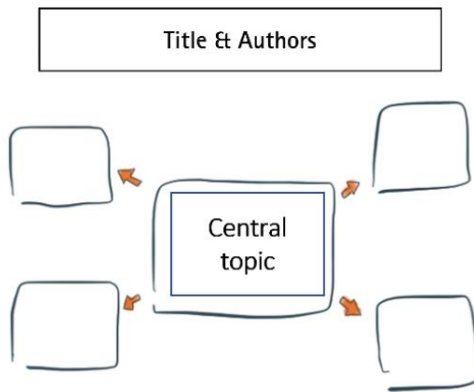
Poster Design

Use your creativity! There are many digital tools and software available that can help you design a great poster. However, some things are important:

- No clutter, no overflow of information
- Focus on the essentials (text + visuals)
- Check if it is comprehensible
- Stick to a branding or a coherent style i.e. color palette
- Adjust the size of the fonds as required for a poster
- Make sure there are no spelling mistakes
- Cite sources as required.

Examples to inspire you

INTELLIGENT AIR HANDLING UNIT BASED ON DIGITAL TWINS

TONGJI UNIVERSITY CDHAW

Members: XIAO Yucheng, ZHANG Wanlin, JIANG Shuxin, HUANG Qianjin, YANG Zheng   Tutor: ZHUANG Zhi

BACKGROUND

CURRENT STATUS OF AHU IN CHINA

65%

MODEL OF AN AHU

DIGITAL TWIN TECHNOLOGY

AHU BASED ON DIGITAL TWINS

FRAMEWORK

Flowrate, CO2, Temperature, etc.

DATA COLLECTION AND OPTIMIZATION

DIGITAL TWIN MODEL

CONTROL STRATEGY OPTIMIZATION

TECHNICAL SCHEME

HIGHLIGHTS

Digital Twin Model   Control Strategy Optimization

Achieving Communication Data transmission

AXC F 2152   Python   EPC 1522

APPLICATION

HoloLEIV – AR based setup and operation of in-line robotic systems

Authors: Benedikt Tobias Müller

Company Supervisor: Dr.-Ing. MBA Michael Stegelmann

Professor Supervisor: Prof. Dr.-Ing. A. Erman Tekkaya

Problem Statement & Derived Goal

The LEIV (Nationale Leichtbau-Validierungszentrum) has a new production machine for making injection moulded parts, developed by the start-up Anybrid. Typically, the machine setup, operation and process control require a separate desktop computer, which takes up space and is often not in close proximity, making it inefficient and adding unnecessary lead time. Anybrid wanted to take a new approach to solve this problem. My envisioned solution uses a controller-free AR approach to achieve a faster machine setup, quick and dynamic process control and live data access while maintaining the worker's mobility.

Technical Solution

My solution is based on a self-developed (I)IOT gateway which enables a bi-lateral communication between the worker's AR device and the machine. Information is retrieved from the machine in real-time and broadcast via an MQTT-broker to the AR device. The newly developed AR app displays the information dynamically based on eye-tracking or manual user input. Control inputs from the user are transferred through the same bi-directional interface, which are translated to real parameters in the control of the machine.

Methods & Tools

Microsoft HoloLens 2
- Already used in the industry
- Failsafe AR display construction
- Robust & intuitive handling
- Truly controller-free enabling dual-hand operation of machines
- Capable of spatial computing
- Does not disturb regular vision

Unity 2022
- State of the art 3D engine
- Long term support

MRTK3
- Newest version of the XR-SDK
- Supports hand & eye tracking

OPC-UA
- Machine-to-machine protocol
- Widespread industrial adoption

MQTT
- Open IOT network protocol
- Robust, fast and efficient

References: Microsoft Corporation, Unity Technologies, OPC Foundation, MQTT.org

Machine Setup

The machine setup mode allows technicans to intuitively configure the machine while keeping their hands free. The technician can see and tweak process parameters of the tool and the robot itself. Information is overlayed on the real machine to facilitate an easy determination of the desired parameters just by looking at the respective parts.

- Supply engineer with needed data on demand
- Using eye tracking to show the desired information
- Pre-selected data is overlayed on the respective part
- Increase efficiency by reducing reliance on computer
- Reduce downtime & increase accessibility

Application: After the manual assembly, the operator can click on the displayed parameters and adjust them for the current setup straight from within the HoloLens without any additional computer.

Fill: 65%
ROBIN Data
Tool: 42°C
Rotation: 90°

Conclusion

Based on first test runs carried out in the company, the following was discovered:

- Intuitive way to help & support engineers
- Increase efficiency & reduce downtime
- Improved accessibility & reaction time
- Extra benefit: Remote control & training

Process Control

Process control enables users to supervise the current process in realtime. Through various tools, such as graph representations and data table views with current and target values, a deep insight into the process can be gained. The data is displayed flexibly as per the user's preference, independent of the user's current position.

- Deep insights into current process
- Access to historical data & dataset comparison
- Quick opportunity for intervention through live control
- Increase product quality through tighter monitoring
- Enables remote control & training

Application: During the ongoing process, the engineer can quickly and easily monitor the process and all sensor data. Live adjustments of process control parameters can be performed based on the user's analysis.

Any questions our doubts?

Please, feel free to contact Klaus Hengsbach from EWA (hengsbach@edunet-wa.com) if you have any questions.