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AFNeT Standards Days

Smart Manufacturing with Academic Support

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Modélisation, Analyse et Conduite des Systèmes
dynamiques

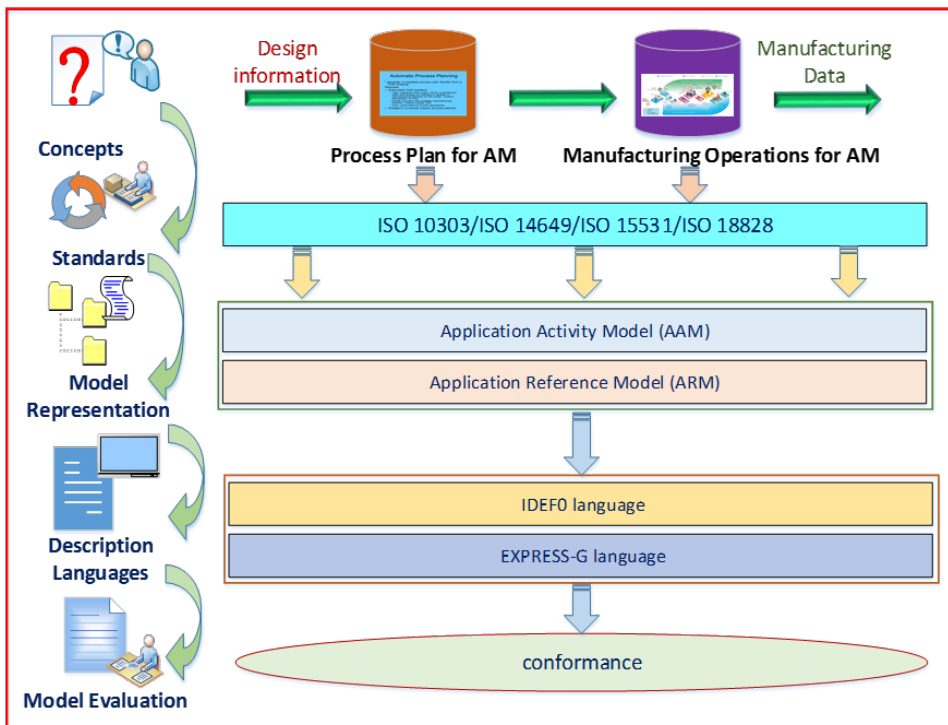
<https://gdr-macs.cnrs.fr>

- Research works
 - To develop new models and preconditions, that can serve as basis for standards proposition
 - To test, evaluate and support standards implementation
- From highly theoretical works to support industrial implementation
- PLM-ERP Interoperability: development of an interoperability framework that is minimally invasive, robust and flexible
 - With the help of SOA-based distributed architecture and standard-based models (STEP, etc.)
- Semantic alignment between enterprise reference models: case of MES
 - Creation of a MES reference model, enriched by alignment with other reference models (in particular ISA-95/ ISO62264) and with B-B, B-S and B-C alignment,

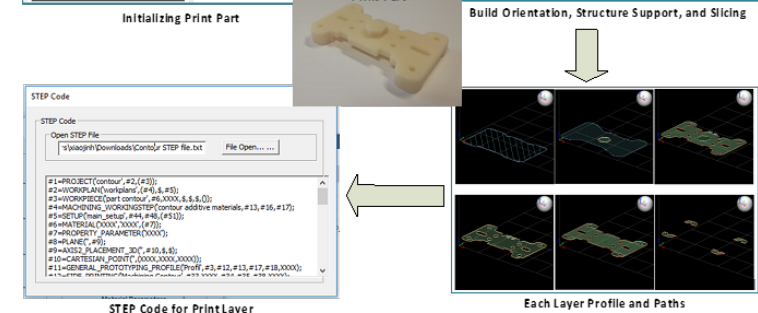
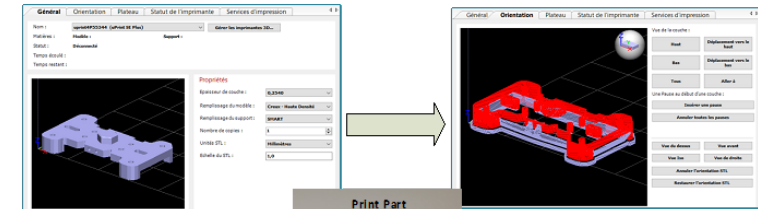
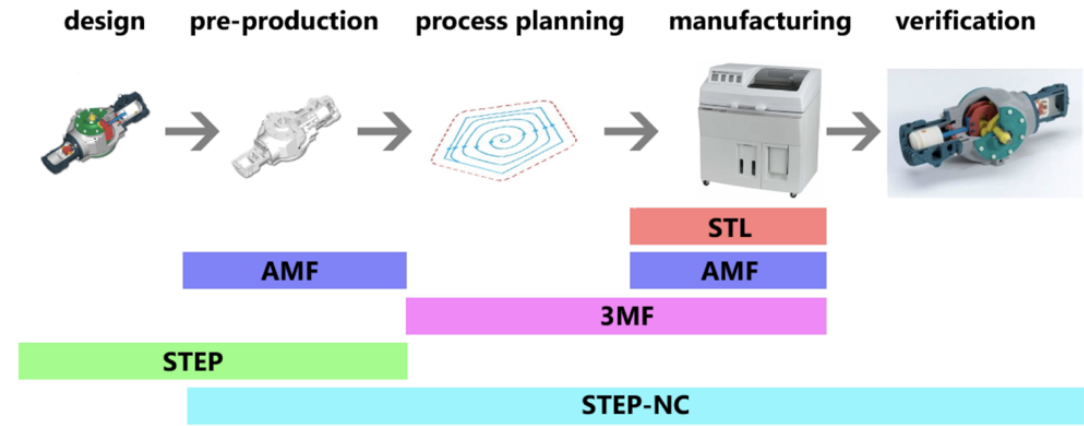
Some examples of research works

• Digital continuity in Additive Manufacturing

Guideline for AM Information System



Standards for AM*

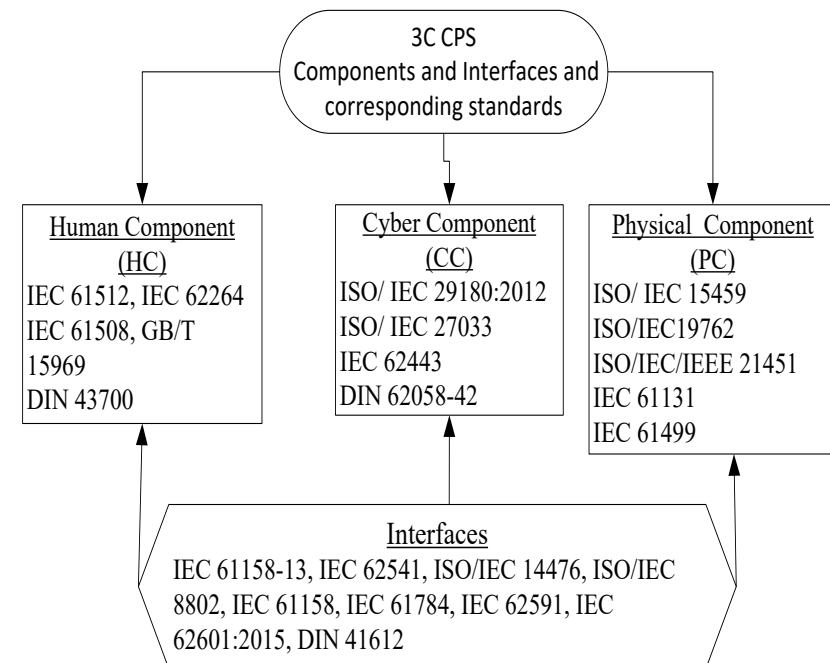
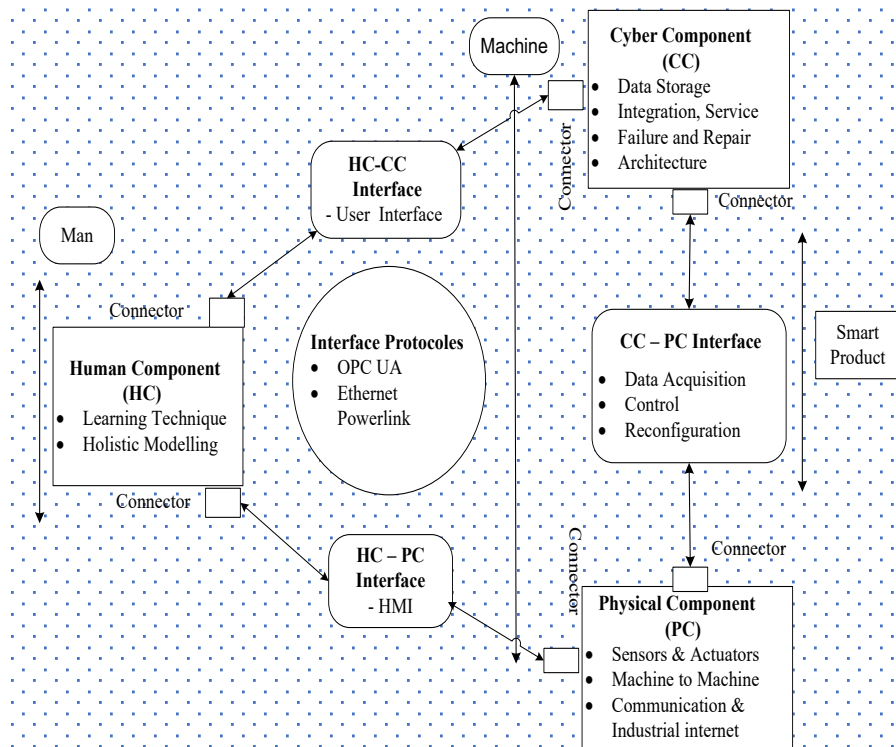


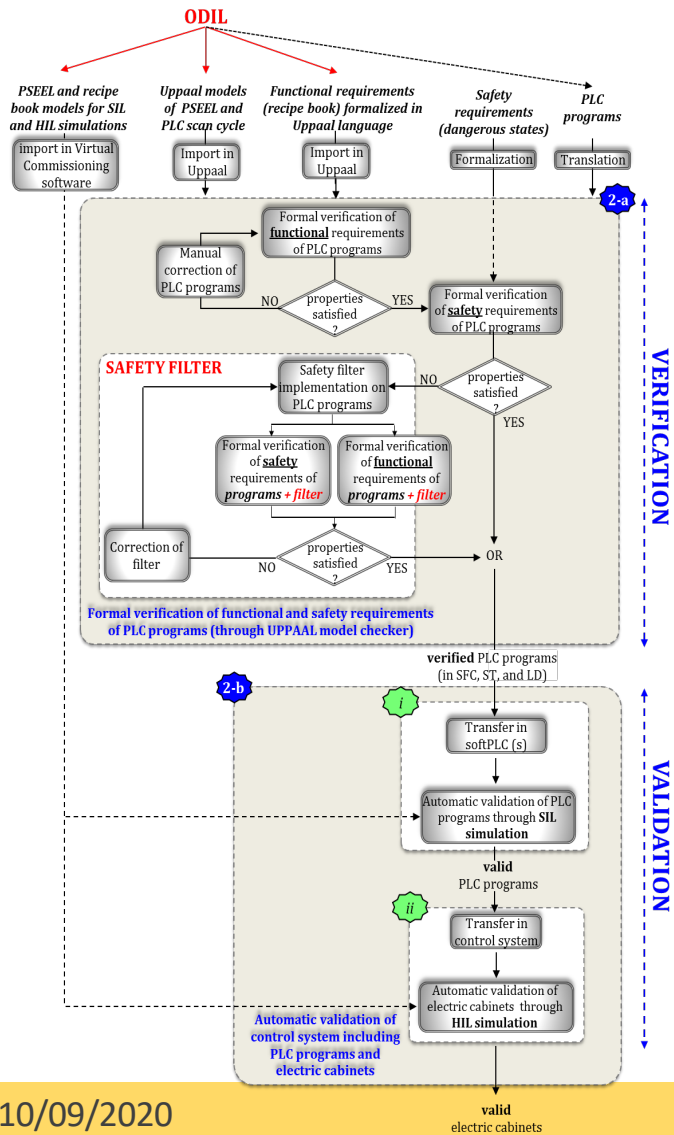
```

STEP Code for Print Layer
STEP Code
Open STEP File
| "C:\Users\...Downloads\Contour STEP file.txt" | File Open...
#1=PROJECT(contour, #2, (#3));
#2=WORKPIECE(workpiece, (#4, #5));
#3=WORKPIECE(part contour, #6, XXXX, 6, 6, 0);
#4=MACHINING_WORKSCHEMESTEP(contour, additive materials, #13, #16, #17);
#5=GETUP(main_setup, #44, #48, (#9));
#6=MATERIAL(COOL, XXXX, (#7));
#7=PROPERTY_PARAMETER(XXXX);
#8=PLANE(#8);
#9=AXIS2_PLACEMENT_3D, #10, (#4);
#10=CARTESIAN_POINT, (XXXX, XXXX, XXXX);
#11=GENERAL_PROTOTYPING_PROFILE(profile, #3, #12, #13, #17, #18, XXXX);
#11=...
    
```

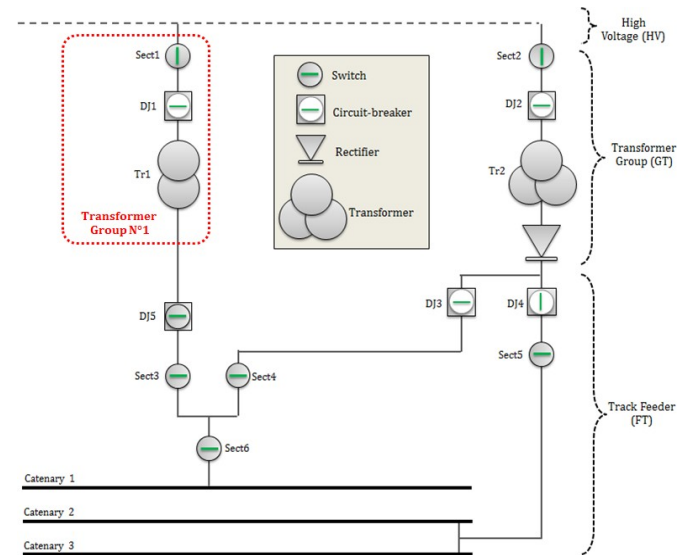
Case study and implementation (FDM)

- Definition of a Cyber-Physical Production System architecture to support implementation in SMEs, with support of standards
 - Scientific objective: Guidelines for CPPS design in context of Smart Manufacturing
 - Results: the 3C CPS architecture and associated Standards mapping





- A methodology for automatic generation, formal verification and implementation of safe PLC programs for Power Supply Equipment of the Electric Lines of Railway Control Systems
 - subject to strict railway safety standards: EN 50126, 2012; IEC 60870-4, 1993)
 - PLC standards: PLCopen, IEC 61131-3



Questions
&
Answers



6th and 7th October

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