Artificial Intelligence for Systems Engineering

Project Group
Artificial Intelligence for Systems Engineering
Systems Engineering
Systems Engineering is an enabler for the development of intelligent technical systems.
Systems Engineering

Systems Engineering considers the complete development process of technical systems
Intelligent Assistance Systems in Systems Engineering
Intelligent Assistance Systems increase Productivity

Requirements Review

Modeling Support

Issue Detection

system design

discipline-specific design

mechanical engineering
electrical engineering
control engineering
software engineering

modeling and model analysis

Review

Issue Detection

system integration

product
Prior Project Groups
Jarvis4MBSE Prototypes

Touch-based Editor:
- Shape Detection
- OCR / HWR
- Speech Recognition

MBSE Knowledge Graph:
- Ranking
- Knowledge Graph
- Recommendations

Virtual Systems Engineering Expert:
- Knowledge Discovery
- Virtual Assistance

Model generation
- Semantic Reasoning
- Entity Recognition
- 

Requirements

<table>
<thead>
<tr>
<th>1</th>
<th>Geometrie</th>
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</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Raddurchmesser: 20 Zoll</td>
</tr>
<tr>
<td>1.2</td>
<td>Rahmengröße: 500 mm</td>
</tr>
<tr>
<td>2</td>
<td>Reihe 102</td>
</tr>
<tr>
<td>2.1</td>
<td>Reihenlänge: 120 mm</td>
</tr>
<tr>
<td>2.2</td>
<td>Betriebslast: 1500 kg</td>
</tr>
<tr>
<td>3</td>
<td>Fertigung</td>
</tr>
<tr>
<td>3.1</td>
<td>Automatisierungsgrad: 60%</td>
</tr>
<tr>
<td>3.2</td>
<td>Ausbringungsmenge: 5000 p.a.</td>
</tr>
<tr>
<td>3.3</td>
<td>Herstellungskosten: 1500 €</td>
</tr>
</tbody>
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+ X
AI Marketplace for Product Creation

Funded Partners

Solution Provider
- Ubermetrics
- Hella Aglaia
- inIT
- CITEC

Platform Core
- FIWARE Foundation
- it's owl
- Fraunhofer
- prostep ivip
- inno focus
- CONTACT Software
- UNITY Consulting & Innovation

INTERNATIONAL DATA SPACES ASSOCIATION
- HEINZ NIXDORF INSTITUT
  UNIVERSITÄT PADENBORN

End User
- CLAAS
- DN
- westaflex
- DÜSPOHL
- HELF
- GUTMANN DIAGNOSTICS

Associated Partner
- NISSAN
- brandgroup
- Brunel
- DB NETZE
- DAIMLER
- DIGITAL IN NRW
- EDAG
- FOUNDER
- FOUNDATION
- garage33
- HADOCO
- HAMBURG AVIATION
- IHK Industrie- und Handelskammer
  Lippstadt – Detmold
- IHK Industrie- und Handelskammer
  Hamburg – Altona
- itelligence
- OWL
- Next Data Service
- M-A-I
- CARBON
- ostwestfalenlippe
- SCHAFFLER
- Smart Electronic Factory
- STARTUP REGION _OWL
- two pillars
- VDE
- VW
Prerequisites & Working Style
Prerequisites

Technology Stack:
- java
- python
- C#
- UWP
- tensorflow
- XAML
- neo4j
- Microsoft Azure
- pyTorch
- Tkinter
- NLTK
- Papyrus
- EMF
- ...

Prerequisites:
- Good programming skills
- Modeling Language
- Interest in MBSE
- Basic Knowledge of ML
- Good Communication Skills
- Self-reliance

Working Style:
- Agile
- Small Teams
- Roles
- Makeathons
- Team Events
- Continuous Research & Ideation
- Bring in own Ideas
- Self-organized
Thank you!
Systems Engineering uses formal models