

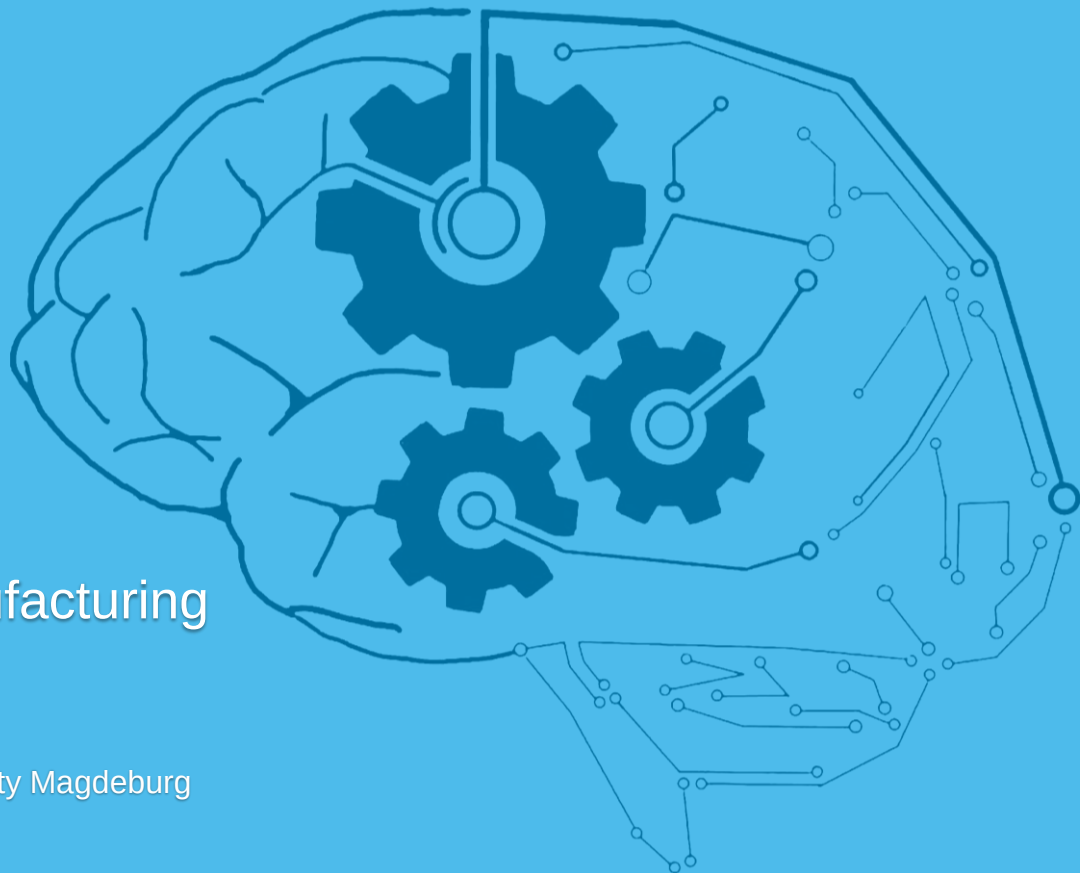
AI Engineering (B. Sc.)

Rethinking Applied AI Education

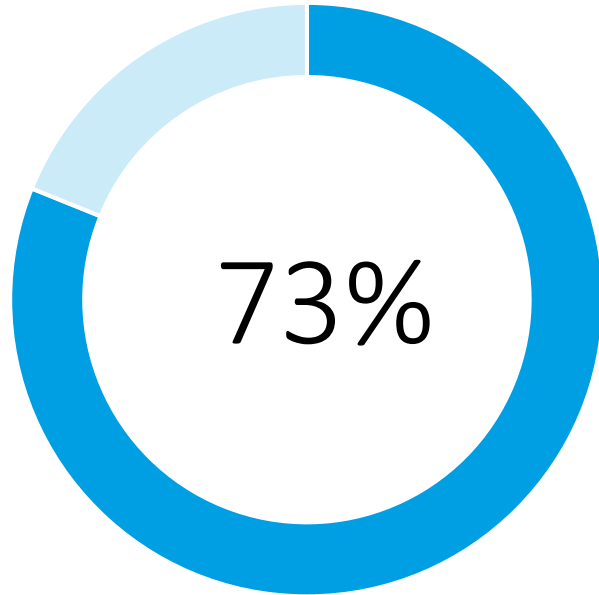
SEMICON Europa, Smart Manufacturing

Benjamin Rolf

Otto-von-Guericke-University Magdeburg



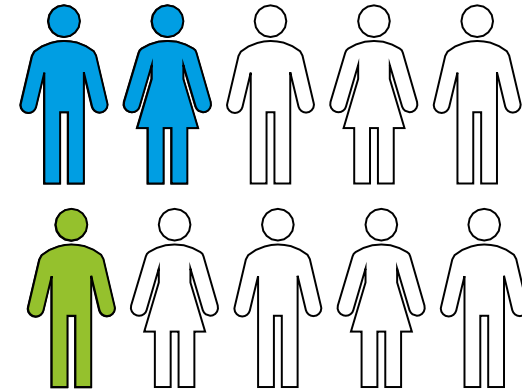
Why did we develop AI Engineering?



of German companies* consider AI to be the
most important technology of the future

* with more than 20 employees

Source: Bitkom (June 2020)



2 of 10

Companies are currently planning or discussing the
use of AI

1 of 10

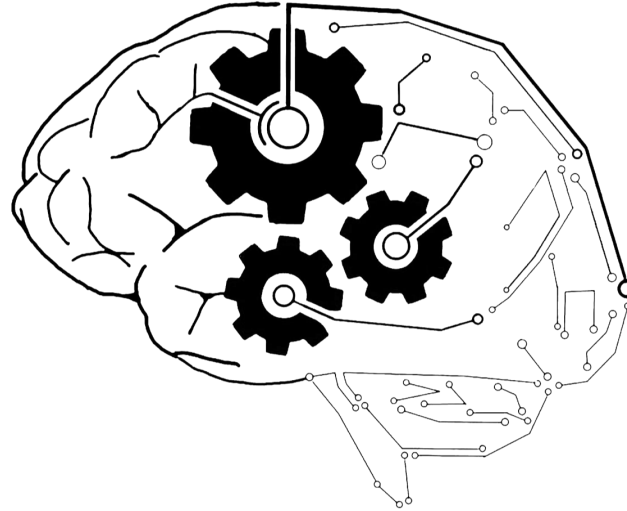
Companies are already using AI

No German university offers study programs that explicitly educate students to become experts in industrial AI systems and services.



And this is where we started!

We proudly present...



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Federal Ministry
of Education
and Research

AI Engineering - Artificial Intelligence in Engineering (B. Sc.)

Competence Profile of an AI Engineer



Analyzing
problems



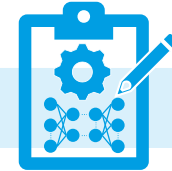
Defining
requirements



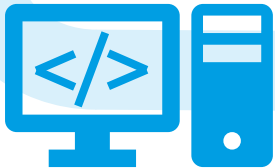
Evaluating the application
potentials of AI



Planning and management
of AI projects



Design and realization of
industrial AI systems



Problem-specific
implementation of existing
AI methods



Development of
new AI methods



Evaluation and improvement
of industrial AI systems with
respect to **safety aspects**

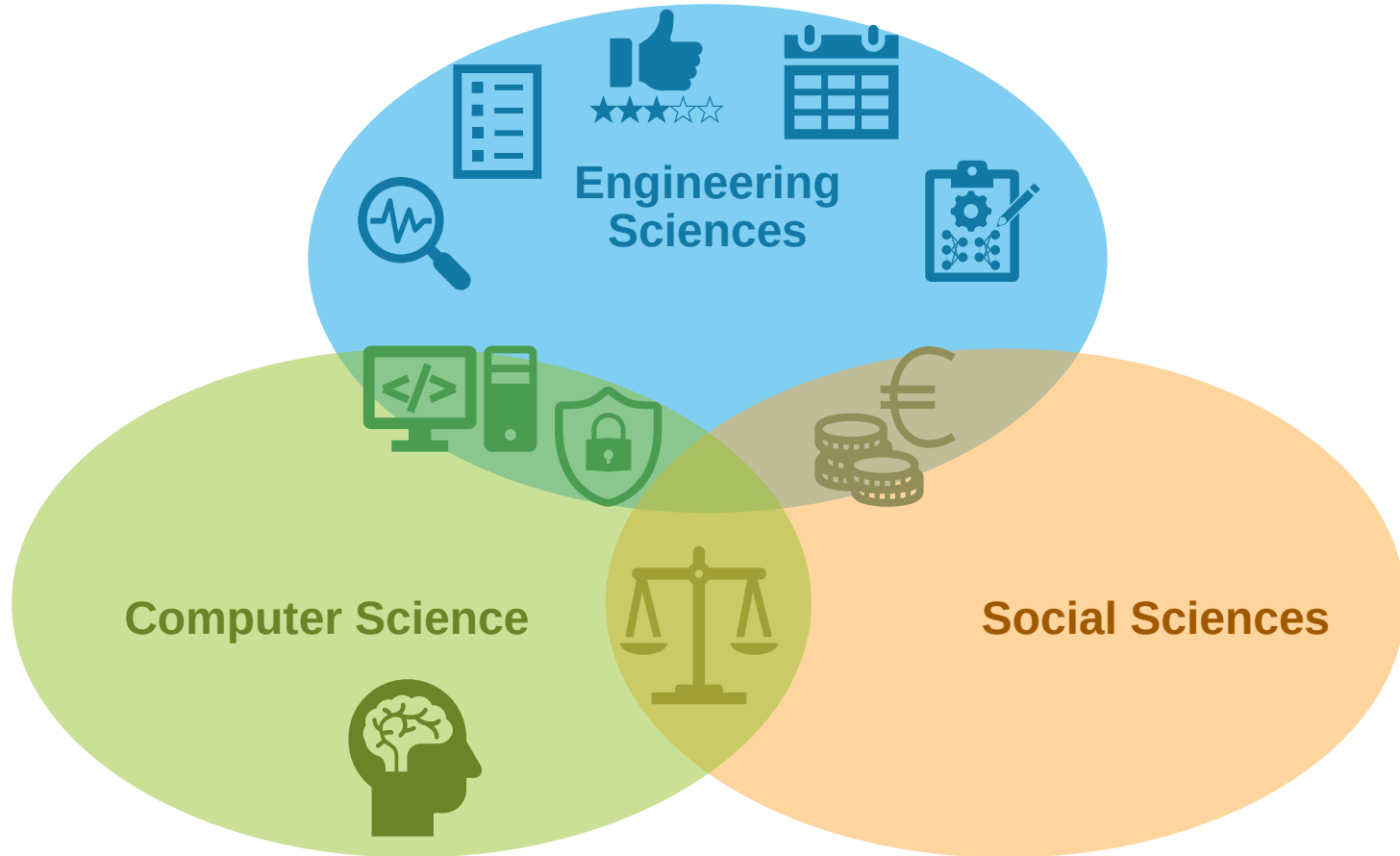


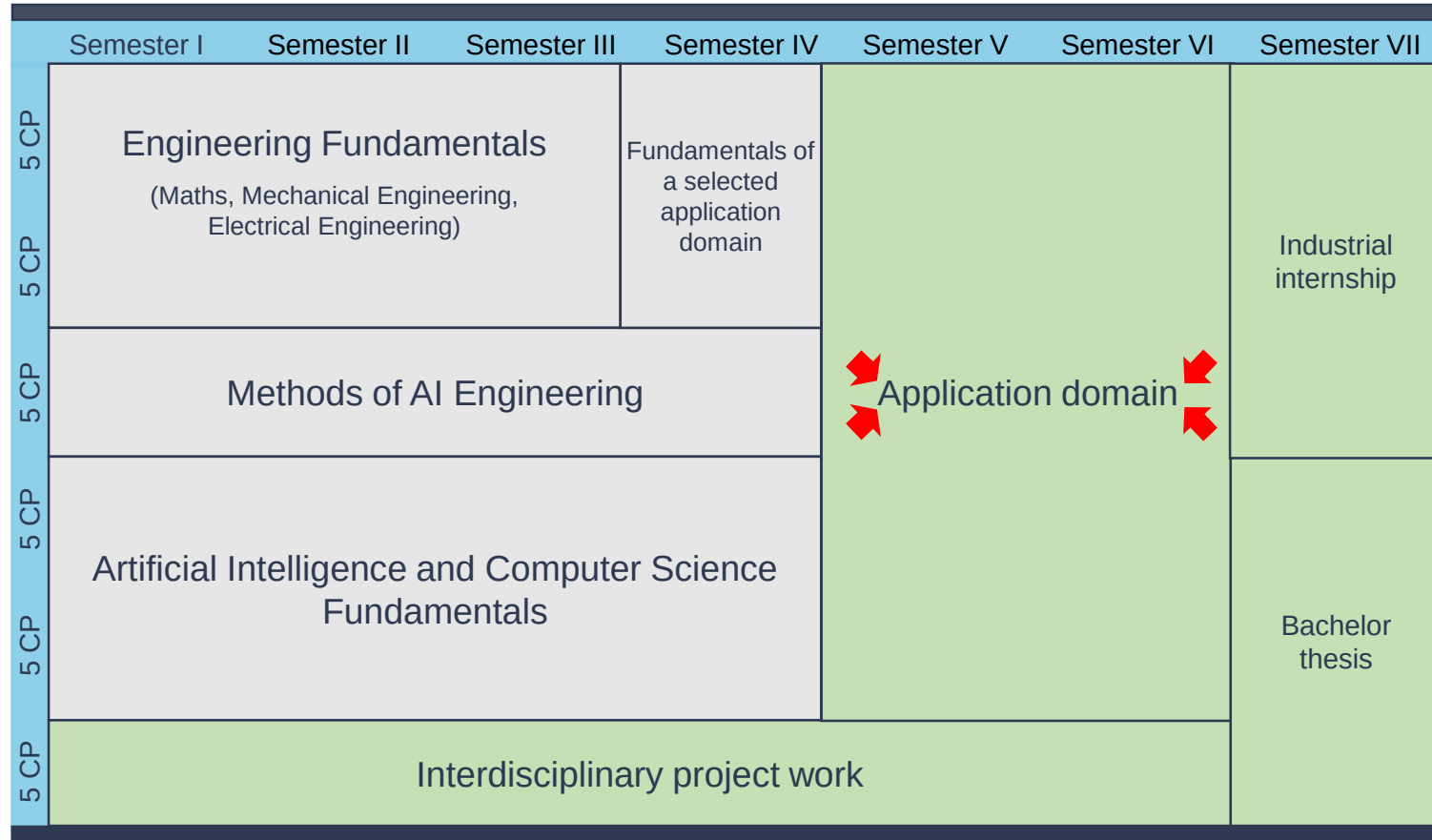
Evaluation and improvement
of Industrial AI systems with
respect to **ethical aspects**



Evaluation and improvement
of Industrial AI systems with
respect to **economic aspects**

Competence profile of an AI engineer





Five Majors at Five Universities



Biomechanics and Smart
Health Technologies

▲ Hochschule Harz

Hochschule für angewandte Wissenschaften

Mobile systems and telematics



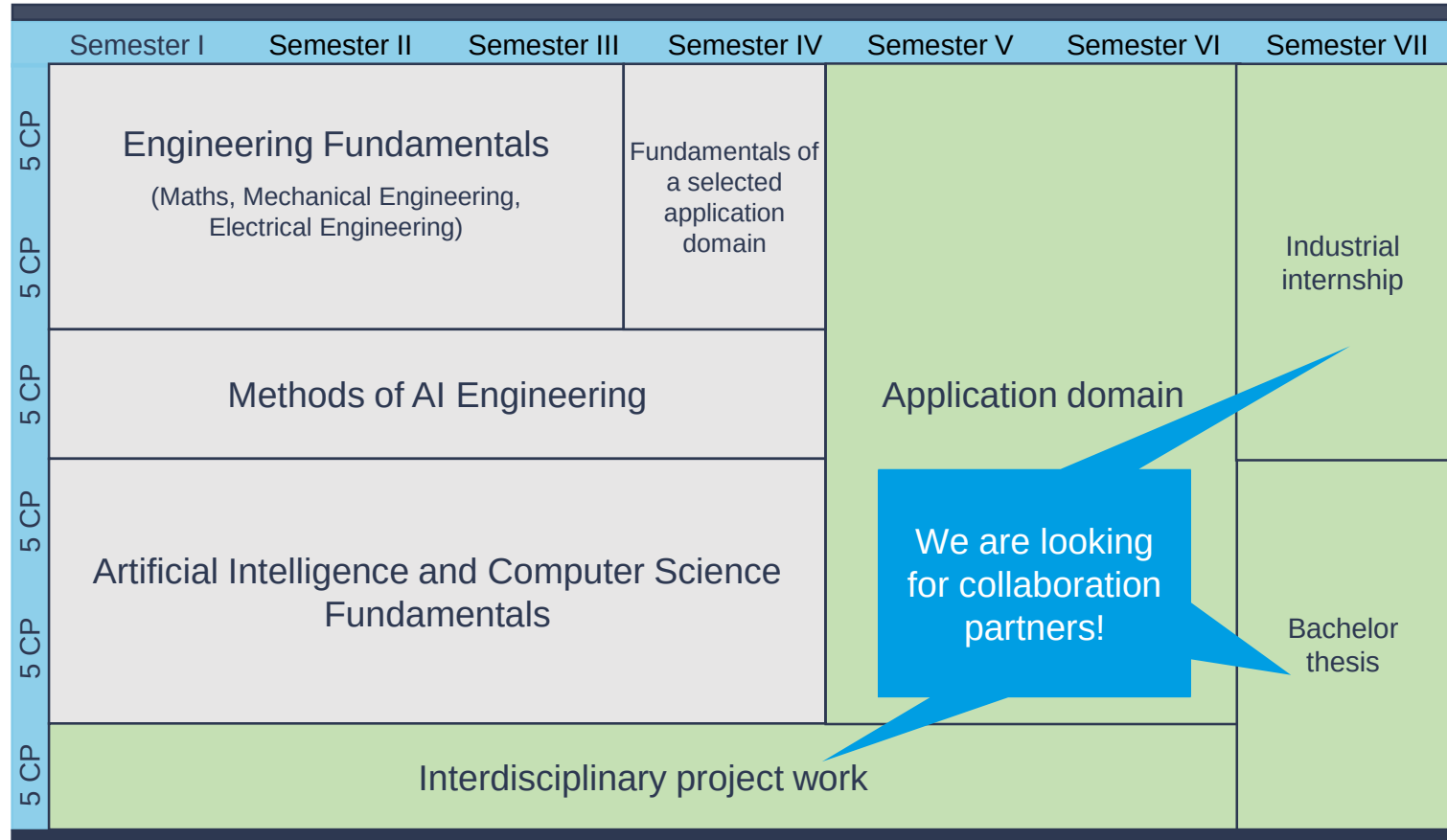
Green Engineering



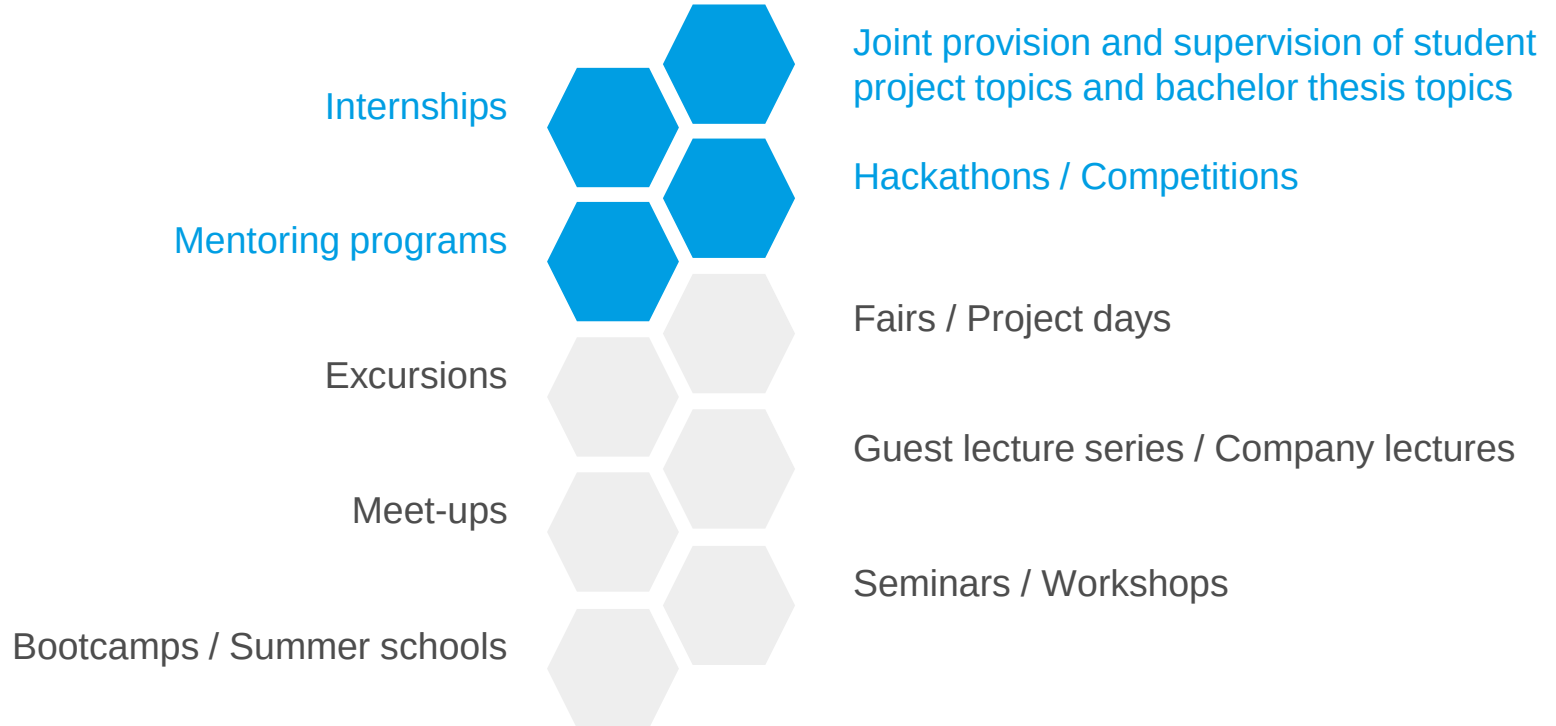
Manufacturing, Production
and Logistics



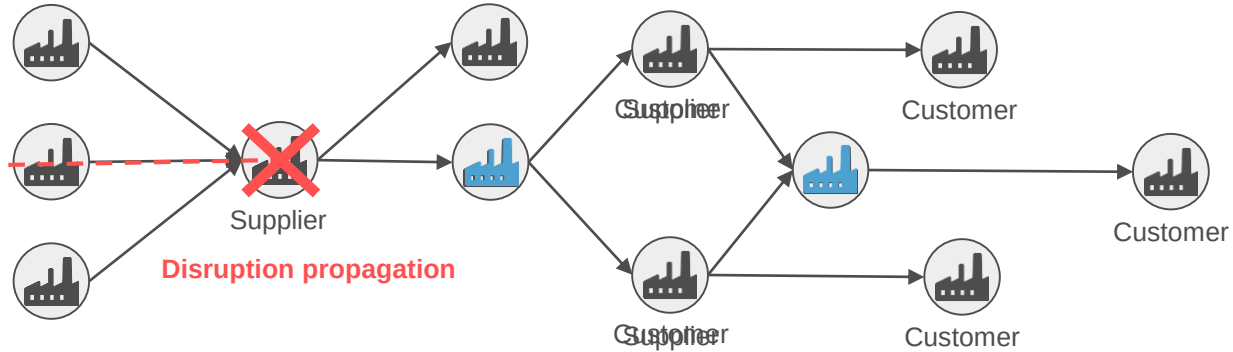
Agricultural Economy and Technology



Opportunities to Collaborate with us



Earthquake causes a disruption of a critical supplier [1]



Industry

Companies optimize their operations based on their knowledge about first-tier suppliers and customers.

↔
Lack of network
knowledge

Academia

Many approaches for supply chain optimization consider multiple tiers of the network.

How can we identify supply networks beyond the first tier?

Pipeline for Supply Network Identification and Optimization

Data sources

Industry databases



Shipment records



Open Data



Coming soon: News,
Social Media, Filings,...

Extraction

Web scraping



Database queries



Visualization

Network tools



Custom visualization



Optimization



Graph-based AI

Network analysis

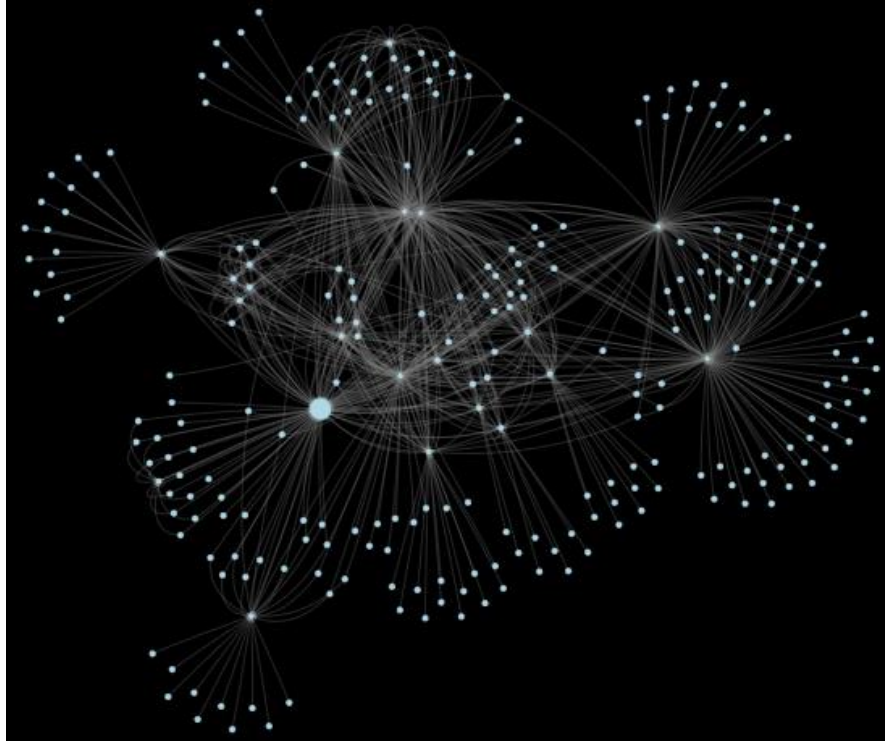
Disruption identification

Analysis of bullwhip and
ripple effects

Multi-tier inventory
management

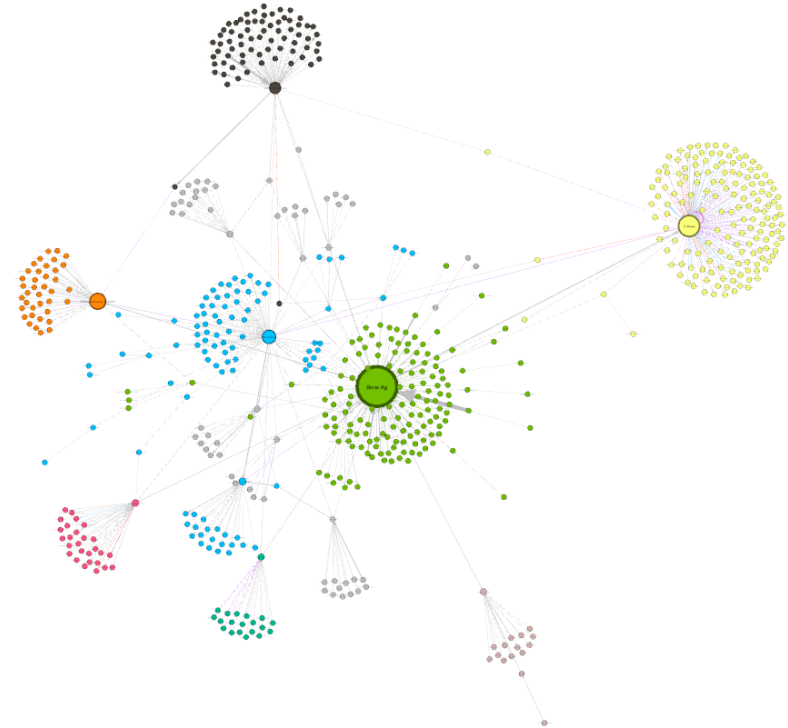
Supplier evaluation and
selection

Example Supply Networks (1/2)



Intel Corp. Supply Network

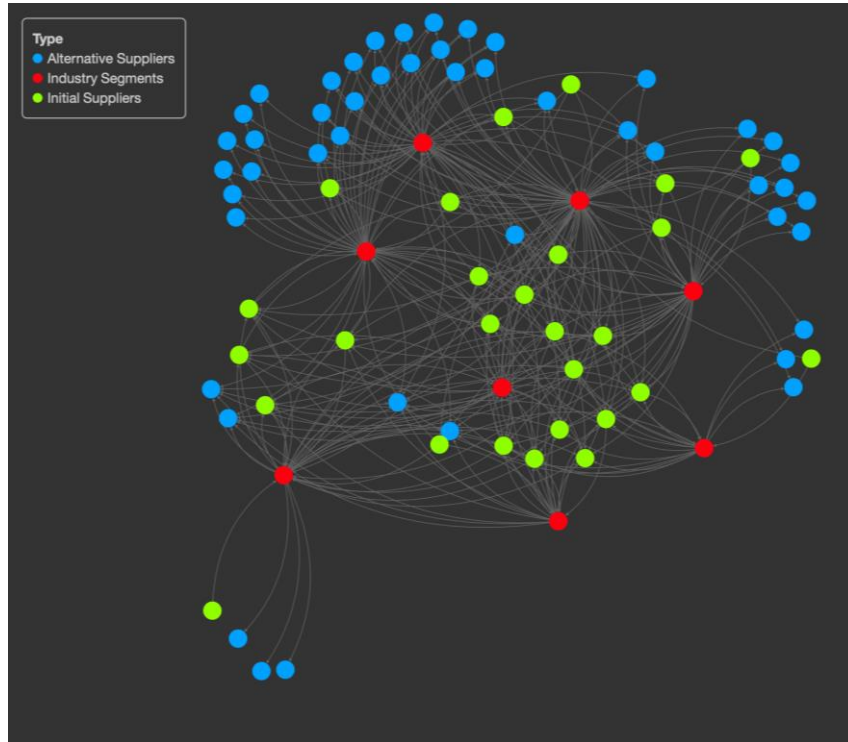
DBpedia → SPARQL → .csv → Python(networkX) → .html



BMW AG Supply Network

ImportYeti → PowerQuery → .csv → Gephi

Example Supply Networks (2/2)



Airbus SE Supply Network

Airframer → webscraper.io → .csv → Polinode



Global Automotive Supply Network

S&P Global → web scraping → .csv → Python (network) → Gephi



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We are actively looking for industry partners. Please don't hesitate to get in touch with us!

- [1] <https://www.britannica.com/event/Japan-earthquake-and-tsunami-of-2011/Aftermath-of-the-disaster>