



# AI in the Wild

## Enabling Exploitation of Artificial Intelligence

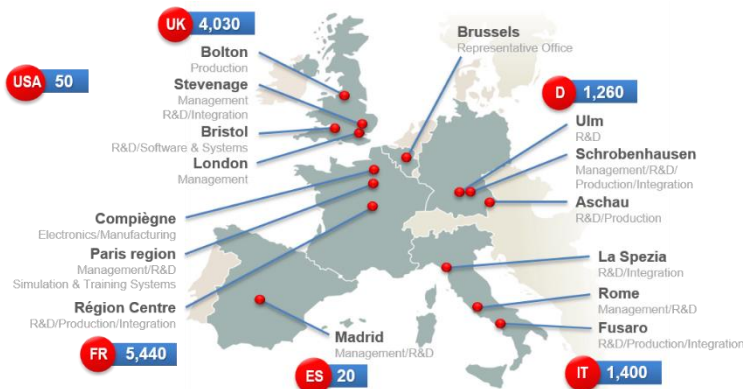
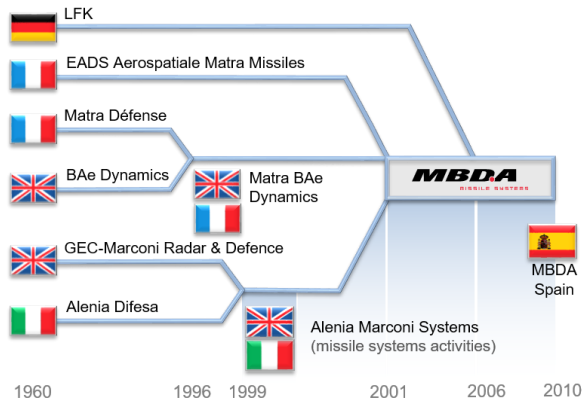
Dr Gary Matson – Technical Expert Image Processing

24<sup>th</sup> November – UDRC Themed Workshop in Autonomous Systems

292/IP/GPM/21/0050/UDRC



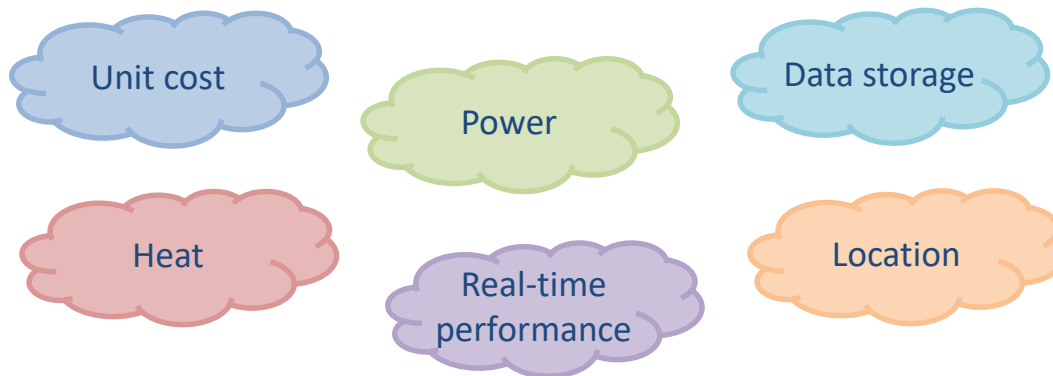
- Created in 2001 from a series of mergers
- The largest European company in the missile systems sector
- The only European company able to meet the whole range of complex weapons needs of the three armed forces
- More than 12,000 people worldwide
  - 60% in Technical/Engineering functions



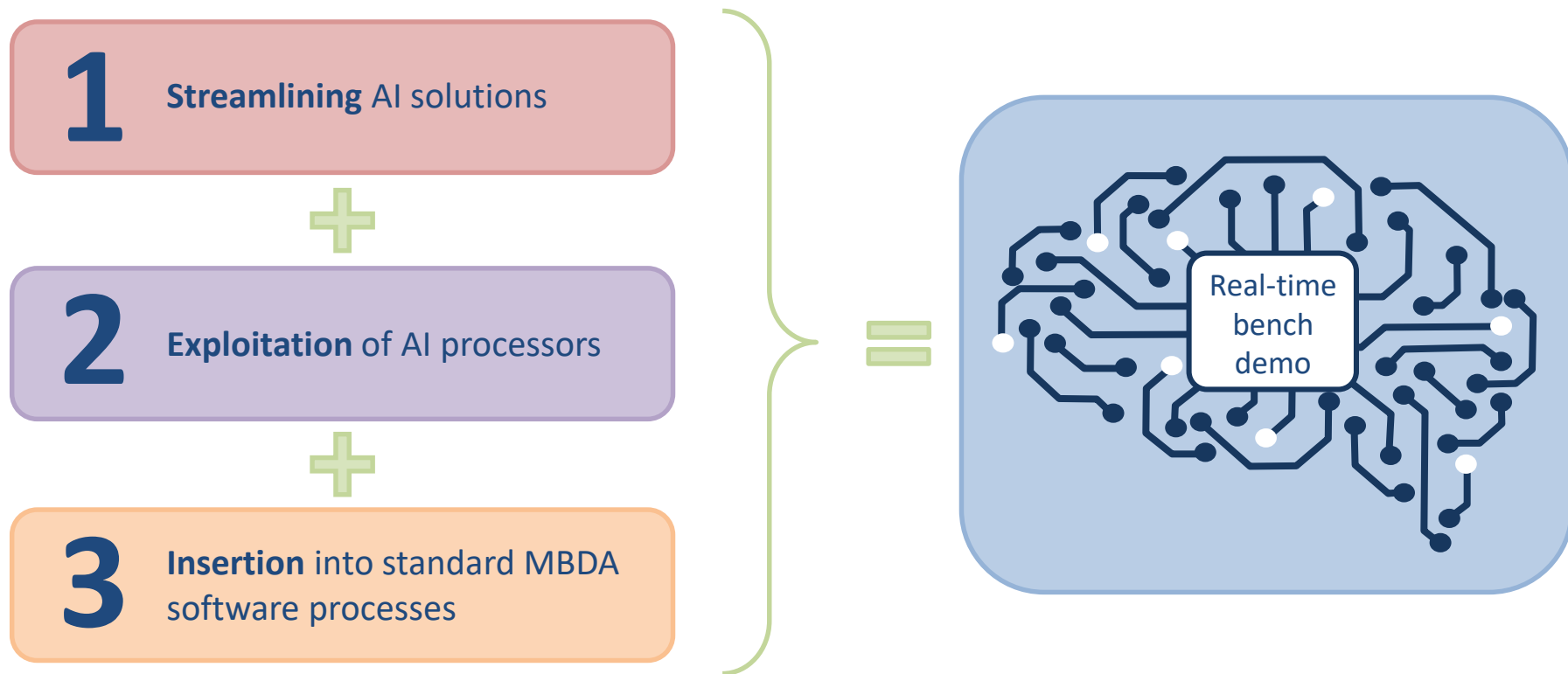
Correct as of March 2021



- Recent explosion of research in Artificial Intelligence (AI)
- **Challenge:** Exploitation on the Edge

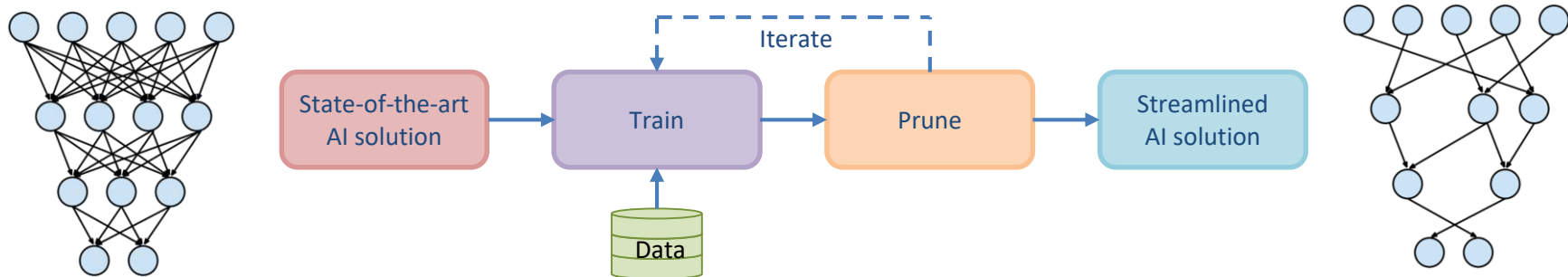


- Major blocker to increasing Technology Readiness Level of AI





- **Challenge:** Amount of computations and memory required for AI
- **Pruning** – Remove elements with smallest impact on result



**Demonstrator result: 90% less computations; 99% less memory  $\Rightarrow$  Only 3% reduction in accuracy**

- **Enables rapid exploitation of state-of-the-art AI solutions, enhances robustness**

- **Challenge:** Use of modern, AI accelerated chipsets
- **Wide range of commercial AI processing solutions**
  - Different challenges within MBDA to wider industry





- **Challenge:** Embedding AI within a standard MBDA software process

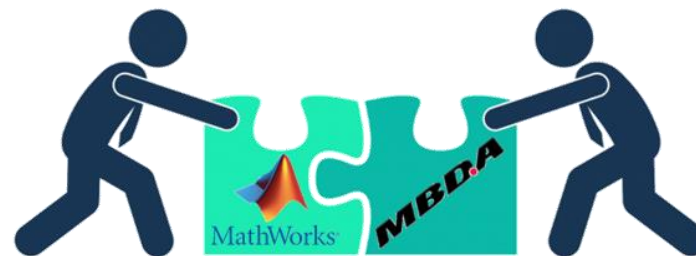
### Utilization of MATLAB/Simulink

- Industry standard Model Based System Engineering tool
- Aligned with MBDA software development processes



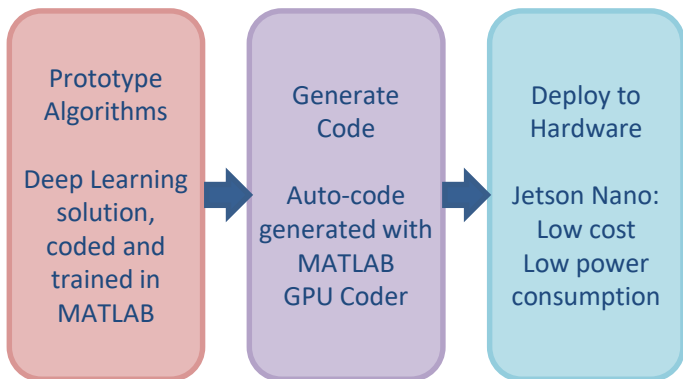
### GPU Coder Beta test

- Partnership with MathWorks

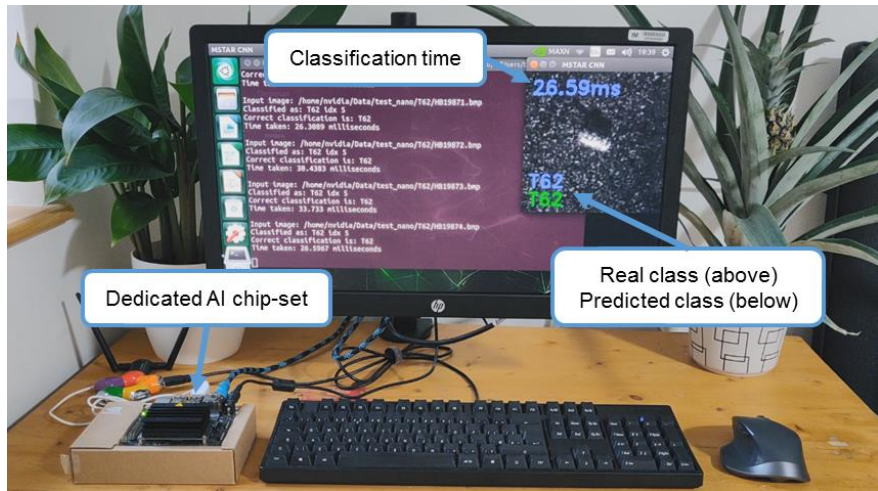




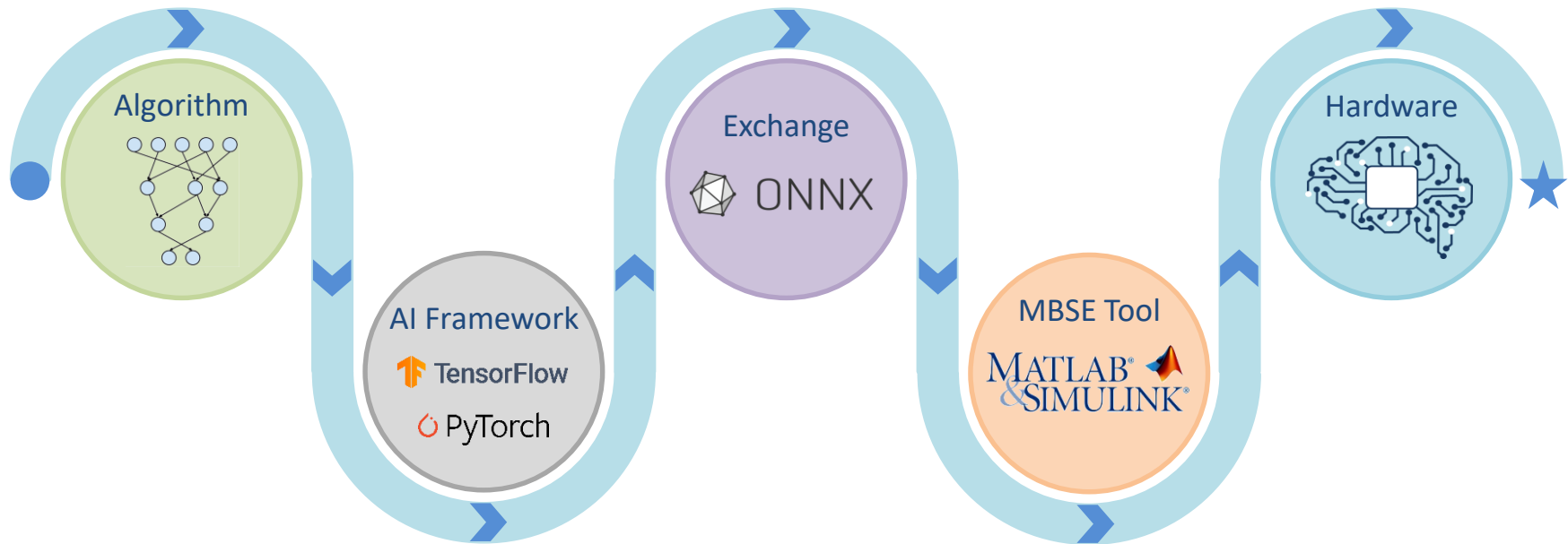
## Automatic Target Recognition Exemplar



Demonstrated potential for real-time exploitation of Deep Learning solutions using standard MBDA software development process



Solution	Standard accuracy (%)	Variant accuracy (%)	Frequency (Hz)	Solution size (MB)
Off-the-shelf	97	93	36	230
Pruned	94	99	167	1



Any questions?