HIPPEROS®
High Performance Embedded Solutions

"Intelligent Autonomy
for a Safer & Better World"

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Avec le soutien de la
Wallonie

Spin-offs de Wallonie

WSL

Embedded Systems Everywhere …

Avionics & Aerospace

Safety Critical Systems

Industrial Control

Logistics & Traffic Control

Power Generation

Medical

Defense

Robotics

Virtual Reality

Navigation & Car Safety

Sensors Are Everywhere

Smart Analog
Enabling Smarter Sensors

Transportation

… and many of them Mission Critical!

Spin-offs de Wallonie

WSL

Why Intelligent Autonomy ?

➢ **Computer vision, AI, auto pilots, collision avoidance, site monitoring …**

Challenges

Performance, Reliability, Efficiency, Security & Affordability

HOW DO WE PUT A SUPERCOMPUTER INTO AN EMBEDDED BOARD ?

http://edablog.com/2013/08/08/blackfin-bf609-pvp/

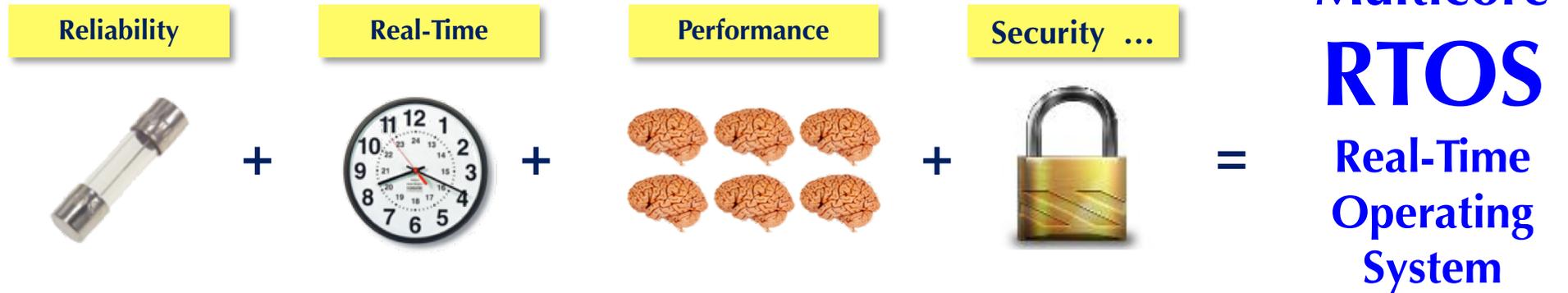https://commons.wikimedia.org/wiki/File:IBM_Blue_Gene_P_supercomputer.jpg

It all depends for a large part on the **Software Platform** formed by the **RTOS, Middleware & Tools**

The Solution is HIPPEROS

High **P**erformance **P**arallel **E**mbedded **R**eal-time **O**perating **S**ystems

| Reliability | + | Real-Time | + | Performance | + | Security ... | = | **Multicore RTOS** Real-Time Operating System |

100+ Man Years of R&D in Kernel Design, IPC, Scheduling, …

Use Cases

- **Autonomous Unmanned Aerial Vehicles (UAVs)**
  - UAVs more common for different applications
    - Surveillance, **search and rescue**, logistics and research
  - On-board real-time processing is **key technology**
    - Efficient and reliable automatic collision avoidance needed
    - Opposing constraints
  - The UAV use case aims to provide
    - Optimized performance-to-weight and power-consumption-to-weight figures
    - On-board stereo vision & depth estimation
    - Real-time and automatic detection of obstacles for **collision avoidance**
    - **Image recognition** and identification

https://irevolutions.org/2014/03/24/launching-a-search-and-rescue-challenge-for-drone-uav-pilots/
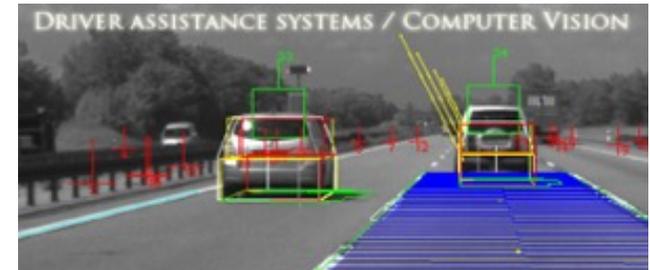
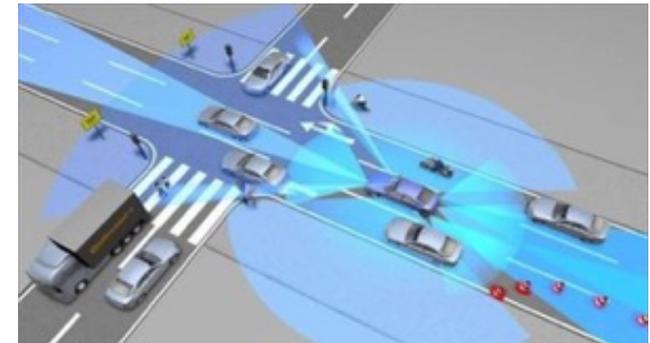Avec le soutien de la

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Use Cases

- **Automotive Driver Assistance System (ADAS)**
  - Intelligent cars need more and efficient embedded devices
    Image processing required for
    - Driving safety
    - Pedestrian safety
  - More active safety systems
    - Vehicle, pedestrian and **object detection**
    - Traffic sign and lane recognition
    - Night vision and surround view
    - Driver monitoring
  - ADAS use case aims to provide
    - **Real-time, low latency high-performance image processing**
    - Reliability and robustness

http://www.rcs.ei.tum.de/forschung/driver-assistance/

https://www.asdreports.com/news-10595/key-players-advanced-driver-assistance-systems-adas-market-north-america-20152019

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Use Cases

- **Medical Imaging**
  - Demand for **high performance yet small devices**
    - Requires processing of large amount of data
    - Mobile imaging equipment replacing high-end infrastructure devices
  - Demand for real-time imaging
    - **Fast processing** of image data during surgery
    - On mobile device
  - X-Ray use case aims to provide
    - Reduction of radiation dose of sensors
    - More powerful image processing
    - **Low power** since heat and other RF emission could disturb sensors
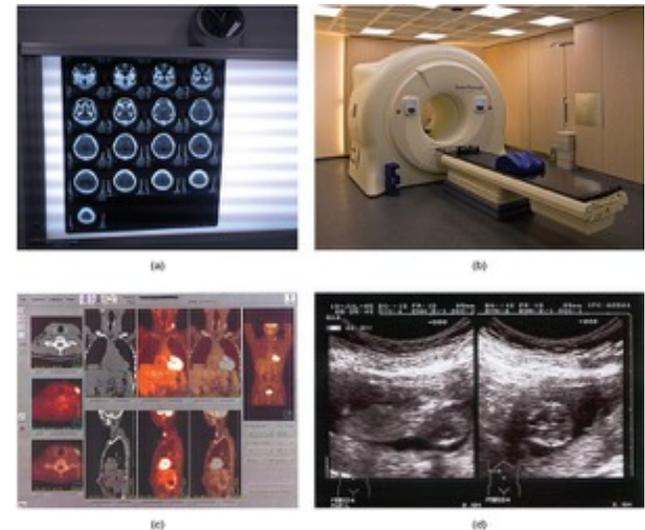
https://commons.wikimedia.org/wiki/File:113abcd_Medical_Imaging_Techniques.jpg

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The Company

"Intelligent Autonomy Solutions"

High Performance Embedded Solutions
for Computer Vision, Machine Learning, Sensors & Control

- HIPPEROS S.A. founded in January 2014, located at Louvain-la-Neuve.
- FIRST Spin-off at ULB in 2010, incubated by WSL & ESA BIC
- 100% Privately funded (thanks tax shelter!)
- Created 12 jobs (Feb. 2018)
- ~ 0.9 MEUR Turnover (2017)
- UWE, Infopôle, SkyWin, DSP Valley, EMVA, …
- Very active in R&D (H2020, Artemis, Plan Marshall, …)
- Academic & industrial partners in EU and USA

HIPPEROS Customers & Partners

Some Feedback About FSO

- Very positive initiative to go From Research To Business
- Concentrates on (long term) technology projects
- Combines Research & Business aspects

- One person is NOT enough …
- Incubation required from start (e.g. WSL)
- More emphasis needed on the business side, early on
- Incentives for industry to be directly implicated needed
- Specific instruments for long term spin-off funding needed

Some Feedback About Ecosystem

A startup needs **SUPPORT, FUNDING & CUSTOMERS** …

SUPPORT ECOSYSTEM
- Excellent high education system, qualified personnel
- Excellent network & support: thanks WSL, NCP, AWEX, CETIC, Clusters, …!
- But too many actors, hard to navigate, …

FUNDING ECOSYSTEM
- Banks & BAs do not really like tech startups, no risk culture …
- University & local invests: nice, but not enough …
- Lack of early stage long term (private) technology oriented funding …

INDUSTRIAL ECOSYSTEM
- Many (very) good SMEs, but often focused on short term
- More service firms or technology users than technology creators
- Local ecosystem lacks critical mass / leaders in high tech sectors
- Industry do not really like startups, no risk culture, … with some notable exceptions !
- Many startups should go international as soon as possible

Thank you!
Any Questions ?

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