AIR CENTRE: MISSION AND VISION

• International, distributed and collaborative network institution
• To foster job creation and knowledge driven economic development in Atlantic regions
• Based in scientific excellence and providing services to the scientific community
• To monitor and decisively contribute to reach the UN sustainable development goals, summarized in 3 main global challenges:
  • Climate Change
  • Digital transformation
  • Income inequalities and population dynamics

Main Thematic Missions
• Bay and stuarine areas
• Floods and natural disasters
• Sustainable food production (aquaculture and agriculture)
• Coastal ecosystems and processes
• Low cost sensors and information systems
• Islands

Basic Scientific Agenda:
• Marine resources and biodiversity
• Healthy and clean oceans
• System integration from deep see to space
• Mitigation and adaptation to climate change
• Sustainable energy systems
• Data Science
• Remote Sensing Sciences
Data Science
- Advanced Computing
  - Big Data Techniques
  - Artificial Intelligence
- Marine resources and biodiversity
  - Healthy and clean ocean
  - System integration from near space to deep ocean
  - Mitigation and adapt. to climate change and natural hazard
  - Sustainable energy systems
- Bay and estuarine areas
- Floods
- Sustainable food production
- Coastal ecosystems and processes
- Islands

**SENSOR LEVEL**
All stakeholders

**DATA LEVEL**
All stakeholders

**APPLICATION LEVEL**
Academia, R&D centers, scientists

**OPERATIONAL SERVICE LEVEL**
Industry (startup, SME, Companies)

**MISSION LEVEL**
Gov. institutions, final users, society

- Climate change
- Digital transformation
- Income inequalities and population dynamics
• AI may contribute to the European growth with 2.7 trillion € (20%) up to 2030
• This is achieved by labour automation, but more important by the development of new products and services as this generates high skill jobs
• Earth Observation from space is the discipline that provides to the AI techniques like “deep learning” the required high volume of data to develop new space-driven markets
• Two different scenarios are envisaged for those new AI products and markets:
  • Land services with continuous monitoring the atlantic coast and islands at very high temporal and geometric resolution
  • Maritime services mapping at high resolution the atlantic ocean
AI + EO LAND SERVICES
NEW URBAN SERVICES

- **Smart Cities**
- Urban Planning
- Urban Risk Monitoring
- Smart Cadaster
- 3D City Models
- Illegal building monitoring
- Real Time City
- Urban-rural interactions
NEW URBAN SERVICES: REAL TIME 3D CITY MODELS
• Monitoring and protection of critical infrastructures:
  • Airports
  • Train stations
  • Ports
  • Energy plants
NEW AI AGRICULTURAL SERVICES

- Precision Agriculture
- Smart Irrigation
- Smart Fertilizer
- Crop identification
- Crop estimation
- Crop damages
- Agricultural Insurance
- Water and Drought Management
- Forestry Management
NEW AGRICULTURAL SERVICES: AGRICULTURAL INSURANCE
NEW AI NATURAL DISASTER SERVICES

- Natural Disaster Monitoring:
  - Flooding
  - Fire Monitoring:
    - Fire Risk Maps
    - Real Time Fire Monitoring
    - Fire cartography
    - Fire recovery monitoring
- Volcanoes
- Earthquakes
- Tsunamis
NEW NATURAL DISASTER SERVICES: FIRE MONITORING
NEW NATURAL DISASTER SERVICES: FIRE MONITORING
NATURAL DISASTER SERVICES: VOLCANOES
NATURAL DISASTER SERVICES: FLOODING MONITORING
NATURAL DISASTER SERVICES: TSUNAMIS (JAPAN)
NATURAL DISASTER SERVICES: TSUNAMIS (JAPAN)
ENVIRONMENTAL SERVICES: DEFORESTATION, ILEGAL MINES
NEW AI GEOSTRATEGIC SERVICES: INDUSTRY PRODUCTION
NEW AI SECURITY SERVICES: TERRORISM ANALYSIS

Before attack

After attack

Buildings destroyed/burned
NEW AI SECURITY SERVICES: INTELLIGENCE
NEW AI SECURITY SERVICES: INTELLIGENCE
AI + EO MARITIME SERVICES
NEW AI MARITIME SERVICES

- Marine Debris
- Coastal Hazard
- Illegal Vessel Detection
- Fisherie Control
- Alga Bloom
- Oil Spill
- Aquaculture
- Ocean Security
- Piracy Monitoring
- Search and Rescue
MARITIME SERVICES: ILEGAL VESSEL DETECTION

Heading 156°

Heading 326°

Heading g 156°
NEW AI MARITIME SERVICES: OCEAN SECURITY

Imagen DEIMOS-1 (Color Rosa)
Fecha de adquisición: 20091109
Hora: 0708.38
NEW AI MARITIME SERVICES: OCEAN SECURITY
Nuevo servicio de Inteligencia Artificial: Seguridad Marítima

Detalle de la imagen del DEIMOS-1
Motivo: Detección de embarcaciones
Fecha de adquisición: 2009-11-09; Hora: 07:08:38
• Search Malasian Flight MH 370
CONCLUSIONS

• The combination of Earth Observation from space (Copernicus) and precise satellite navigation (Galileo) provides to the AI techniques like “deep learning” and new data processing systems the required high volume of data to develop new space-driven markets

• This can be achieved by:
  • Full atlantic land monitoring at cm resolution with a high frequency
  • Blue world monitoring mapping the atlantic ocean

• The development of new products and services based on above assets can foster the expected impact of AI in the European growth of 2.7 trillion € (20%) up to 2030 and the generation of thousands of high skill jobs