Project Area: Data, Content and Media

Objective: The PA objective is both to advance methods and technologies and to discover piece of knowledge for a better understanding of individual and collective phenomena and behaviors and for the construction of intelligent and autonomous systems in challenging domains.

The main research and development challenges concern the
- **modelling, analysis, and visualization of data,** which cannot be processed with traditional methods;
- **extraction of knowledge and learning predictive models from multi-dimensional, multi-sources, networked, and dynamic data** based on artificial intelligence, data mining and network science methods;
- **intelligent processing of image, audio, and audio-visual content** for the development of applications based on content recognition;
- **analysis and comparison of digital content for 3D models**, and more generally, multi-dimensional representations;
- **development of applied ontologies of socio-technical systems and semantic technologies** for their treatment based on the languages of the semantic web and for semantic interoperability;
- **natural interaction with computer systems** based on multimodal paradigms that make it accessible and usable.

The AP research and development activities involve
- **15 CNR Institutes**: ISTI, IMATI, ITC, IIT, ISTC, IREA, IEIIT, ICAR, IASI, IAC, STIIMA, IFAC, GI, IRC, ISTEC
- **a total of around 600 person-months per year**.

Scientific Impact & Results will cover
- database and semantic web technologies
- knowledge representation and management
- data visualization, data mining and pattern recognition
- machine learning, and artificial intelligence, complex system theory and network science
- information retrieval and text mining, statistics and applied mathematics
- natural language processing, computer vision and computer graphics
- user modelling and cognitive computing

Approach: The **AP approach and research activities** will be developed according to the following research lines
- **DATA**
  - Line1: Big data Sensing and Management
  - Line2: Knowledge Representation, Reasoning and Engineering
  - Line3: Knowledge Extraction and Semantic enrichment
- **CONTENT**
  - Line 4: Data Mining and Machine Learning
  - Line 5: Network Analysis
  - Line 6: Behavior Analysis
- **MEDIA**
  - Line 7: Acquisition, modelling, and analysis of images, videos, 3D and multidimensional data
  - Line 8: Multimodal Interaction and Accessibility