Leonardo’s Call for Recruits

Visionary mind wanted

Game changer wanted

Forward-thinker wanted
Profiles and Job-Descriptions

1. Expertise in Artificial Intelligence / Autonomous Intelligent Systems

**Main technical skill:**
- Experience in: Neural Networks, Machine Learning and Deep Learning frameworks (e.g. TensorFlow, PyTorch, Café, Keras, scikit-learn, mlr, caret, CNTK, MLlib etc.); knowledge representation and symbolic reasoning; data mining, predictive modelling, statistical modelling, large scale data acquisition, transformation, and cleaning, both structured and unstructured data;
- Advanced programming skills in: MPI, OpenMP, CUDA, H2O, MATLAB, C/C++, Fortran, Python, etc.
- Proficiency with Linux Operating Systems and Workload Managers, HPC visualization tools and libraries, (e.g. Paraview, OpenGL, OpenCV)
- Familiarity with: Git tool, AGILE methodology and Continuous Integration, HPC profiling and debugging tools, common toolchains (GNU, LLVM, Intel, Nvidia/PGI)
- Basic knowledge of Electronics
- Experience with ROS

Industrial design experience and knowledge of design software tools (primarily with Creo, ANSYS)

**Examples of envisaged application fields:**
predictive modelling, computer vision, text mining, graph analytics, natural language processing and text analytics, image denoising, super-resolution, sparse representations, anomaly detection algorithms, cognitive software, image processing, adversarial machine learning, anomaly detection algorithm, autonomous intelligent systems design, AI tools applied to manufacturing and production environments, software defined radio/networking in tactical communications, contextual AI, co-bots, teleoperation and telemanipulation, human-robot interaction, manned and unmanned teaming capability.

2. Expertise in Big Data Analytics

**Main technical skill:**
- Advanced programming skills: Python, C++/C, Spark, Hadoop, Hive, Cassandra, MongoDB, Hibari, Redis
- Proficiency with SQL DB (one or more): MySQL, MariaDB, SQLite, PostgreSQL
- Advanced proficiency with cloud and container technologies (one or more): Kubernetes, OpenStack, Singularity, Docker
- Software engineering: Familiarity with GIT tool, AGILE methodology and Continuous Integration
- Familiarity with I/O architectures: POSIX filesystems, data encryption technologies, data protection technologies
- Proficiency with data analytic and machine learning tools (one or more): Rapidminer, Pentaho, OpenRefine, Pandas; Linux Operating Systems and Workload Managers
- Experience with tools: in the distributed computing, vGPU (CUDA), cloud platforms and Big Data domains (e.g. GCP, AWS, MS Azure, Hadoop, Spark); in data mining, predictive modelling, machine learning, statistical modelling, large scale data acquisition, transformation, and cleaning, both structured and unstructured data
- Excellent knowledge of cloud development and environments (e.g. AWS, Google Cloud, Open Telekom Cloud, IBM Cloud, …)
- Strong experience in the design and development of data processing pipelines for Batch and Streaming data services

Examples of envisaged application fields:
data analytics, real time data analytics, predictive maintenance, video / images- time series, geospatial Artificial Intelligence, digital twinning, Cyber Security.

3. Expertise in High Performance Computing

Main technical skill:
- Advanced programming skills: C, C++, Fortran; one of Python, Julia or Ruby; MPI, OpenMP, CUDA
- Computer architecture competences: RISC and CISC processors, GPU architecture, caches, vector instructions, advanced processor features
- Knowledge of the most common algorithms: FFT, dense and sparse Linear Algebra, stencil operations, Galerkin methods, Conjugate Gradients methods, Simulated Annealing, Lattice Boltzmann, etc.
- Knowledge of the most common libraries: Blas, Lapack, Scalapack, FFTW, PETSc, HDF5, Boost, etc.
- Software engineering: familiarity with GIT tool, AGILE methodology and Continuous Integration, HPC debugging tools, HPC profiling tools; familiarity with the most common toolchains (GNU, LLVM, Intel, Nvidia/PGI)
- Proficiency with: Linux Operating Systems and Workload Managers, HPC visualization tools and libraries, OpenGL, OpenCV
Examples of envisaged application fields:
CFD, FEM, DEM, MD, development of Leonardo HPC road-map and participate to the EuroHPC project.

4. Expertise in Electrification of Aeronautical domain (and Vehicles)

Main technical skill:
- Experience in: electrical energy storage systems (incl. batteries, supercaps, fuel cell, etc.), multi-physics integrated simulations software (e.g. Simcenter Amesim, Ansys, Phoenix, Modelica integration, etc.), high power, high voltage electrical systems
- Knowledge of chemical energy storage systems (incl. biofuel, H2, etc.).
- Advanced programming skills in: Matlab Simulink, C/C++.

Examples of envisaged application fields:
aeronautic electrical system, energy storage, aeronautic propulsion, non-traditional aerodynamic solutions enabled by electric propulsion, innovative aircraft configurations (eg distributed propulsion, synchronization of distributed engines, blown wing, etc.), solutions for the energy systems control, impact analysis of the energy usage strategy and recharge/discharge time, constraints on the energy storage system requirements.

5. Expertise in Materials & Structures

Main technical skill:
- Strong experience in polymer characterization (DSC, TMA, DMA, FT-IR, ...)
- Experience in composite material fabrication processes
- Knowledge of materials stress and design
- Working knowledge of implicit and explicit FEM codes (e.g. Abaqus, MARC, RADIOSS, etc.).

Examples of envisaged application fields:
mechanical tests needed for material characterization (stress vs strain rate or other, depending on the identified method) or for analysis method validation; design of new materials for aerospace applications, design of multifunctional materials (e.g. nanostructured, graphene, etc...).
6. Expertise in Quantum Technologies

Main technical skill:

Expert in the quantum technologies and in particular:
- Quantum Secure Communications and Information technologies
- Quantum sensing, with particular focus on sensors for inertial navigation

The position holders will be required to investigate and propose solutions in the following research areas:
- Fiber optics Quantum Communications Infrastructure, investigating innovative solutions to overcome range/key rate, to develop innovative protocols and encoding schemes, to improve security and to improve critical components performances (high efficiency-low noise detectors and single-photon sources).
- Free space Quantum communication links, investigating innovative solutions
- Quantum random number generators, investigating practical and integrate quantum devices.
- Security evaluation of the aforementioned systems against implementation attack
- Boson sampling for encryption technologies (boson sampling IC for fast encryption).
- Quantum sensors and Clock sources capable to guarantee the continuity of positioning and timing services in case of GNSS unavailability.

Examples of envisaged application fields:
secure communications, advanced sensors.