



Press Release

Paris, March 19th, 2024

***Theia*: the revolutionary innovation that will accelerate digitization, relocation and decarbonization of industry**

Spare Parts 3D (SP3D) is a Toulouse-based start-up born in 2018, labeled Young Innovative Company for its disruptive innovation in industry: DigiPART™, its AI software that identifies, digitizes and 3D prints its customers' spare parts.

Spare Part 3D, France 2030 program award winner, member of French Tech & French Lab and "Ambassadeur de la Team France Export" is **today presenting the innovation "*Theia*", the first results of the three-year R&D project, launched in 2022, in partnership with LURPA** (university research laboratory in automated production) at ENS Paris-Saclay **and with financial support from the Defense Innovation Agency (AID).**

Theia is a revolutionary innovation that **automatically creates a 3D model of a part from its 2D technical drawing, thus lifting a technical barrier that manufacturers have been waiting for for over 30 years. In this respect, *Theia* represents a major technological leap forward, enhancing the capabilities of the DigiPART™ software.** The latter can already determine, on a large scale, all technically AND economically printable spare parts, create their digital twin (digital passport) and identify a 3D printing supplier for on-demand printing, as close as possible, using the most suitable materials and processes.

Not all companies have scanned the 2D technical drawings of their spare parts. Even if these are available in electronic form, converting them into 3D models is a time-consuming and costly process. ***Theia* automates this process**, reducing the conversion time from days to minutes. ***Theia* contributes to accelerating the exhaustive digitization of spare parts inventories, lowering the cost of access to digitization, democratizing the digital passport and the use of additive manufacturing.**

For Professor Nabil Anwer, CIRP Fellow, Professor at Paris-Saclay University, Deputy Director of LURPA at ENS Paris-Saclay, and expert in shape engineering and 3D reconstruction:

"Theia addresses two major challenges: on one hand, reading, understanding and interpreting the information present on the drawing, and on the other, obtaining a 3D shape from its representation on 2D plans, while respecting the geometric and dimensional specifications of the original object. The development of Theia is the result of a harmonious marriage between new developments in AI (deep learning, segmentation, automatic labeling, etc.), mastery of classic computer vision technologies (optical symbol recognition, feature matching) and semantic analysis of technical drawings. This combination makes it possible to identify the various semantic layers of the 2D drawing and thus to interpret the technical drawing in an optimal way for its 3D reconstruction".

The benefits brought by *Theia* are economic, social and environmental.

Economically :



- **By providing THE solution for digitizing spare parts inventories**, it facilitates equipment maintenance strategies thanks to a significant reduction in storage costs and the almost immediate availability of spare parts;
- **By mass-producing parts additively**, on demand and locally, it saves procurement time and costs, making supply chains shorter and more fluid.

Theia is a competitive boost for manufacturers;

Theia also supports the Ministry of Defence's innovation policy, by helping to maintain equipment in operational condition, which will benefit Defence's industrial and technological base.

Environmental :

Theia programs the end of parts and machine obsolescence. Thanks to digital catalogs and additive manufacturing, stock obsolescence becomes a thing of the past. The reparability of parts and the lifespan of machines can be extended as much as desired. Quite a benefit for the planet.

By enabling manufacturers to adopt additive manufacturing on a large scale, **Theia makes it** possible to produce on demand with a **technology that consumes less material** than subtractive or traditional manufacturing technologies. By bringing production closer to the point of use, Spare Parts 3D will help **reduce** transport-related **CO2 emissions**. **At COP 28, UN officials hailed the digitization of supply chains** as an important factor in the decarbonization of industry, in line with the UN's Sustainable Development Goals.

Territorial and social: the potential relocation of industrial production within a given geography and the reduction in external costs offer **independence from increasingly chaotic foreign supply chains**.

For Paul Guillaumot, founder and CEO of Spare Parts 3D: "Theia is a world first. It is a disruptive innovation, that represents a major technological leap forward that makes it possible to digitalize supply chains on a massive scale for sectors such as energy, defense, petrochemicals, railways, shipping and mining, where the need for spare parts is considerable.

Theia will deliver considerable savings by reducing physical inventories of spare parts. According to a 2018 study by Theano Advisors, the global inventory value of printable parts was \$174 billion (€160 billion). Considering an average inventory cost of 20%, Theia will save companies \$34 billion (€31 billion) a year through digitalization.

*These initial results, the first major step in the R&D program for which I would like to thank our partners, will give rise to the first publications in mid-2024. We are also launching **a call for industrial beta testers to take part in an operational trial of Theia.** URL link to register for the beta tester program: <https://spare-parts-3d.com/theia-beta/>*

The next step will be to generalize 3D reconstruction from drawings and parts of any complexity, and to obtain parametric files. The latter will enable us to automatically modify them according to the chosen manufacturing processes.

Link to Theia's illustrative video: <https://youtube.com/shorts/uWe3iyaT96c?feature=share>



About Spare Parts 3D

Spare Parts 3D is a French startup that develops DigiPART, the most efficient software solution for identifying, digitizing and 3D printing spare parts. Spare Parts 3D helps its customers decarbonize and reconfigure their spare parts supply chains.

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About the Laboratoire Universitaire de Recherche en Production Automatisée (LURPA) at Ecole Normale Supérieure de Saclay



The Laboratoire Universitaire de Recherche Automatisée (LURPA) is a unit of ENS Paris-Saclay and Université Paris-Saclay, whose research activities focus on the factory of the future. LURPA is a major player in the specification and geometric verification of products in cyber-physical production environments. The laboratory has extensive expertise in the functional and geometric description of mechanical products, and collaborates with leading academic, institutional and industrial players in the fields of digital twins and manufacturing intelligence.

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