RoboNimbus

A robotic revolution powered by AI

Robots are becoming cheaper and more capable in sophisticated environments. To capitalise on this, the Joint AI Call 2020 project RoboNimbus (Smart Platform for Robot Management and Coordination with AI-powered Cloud) will create an AI-powered, cloud-based platform for the all-in-one connection, monitoring, control and maintenance of robot fleets across domains.

Addressing the challenge

Various domains are facing increasingly complex operational requirements that lead to rising costs, lower efficiency and higher absenteeism. Healthcare, for instance, is seeing a growth in demand through an ageing population yet a shortage of qualified workers. Such challenges are pushing the development of industrial robots, creating the need for smart management via a common platform that coordinates robots centrally. AI-based techniques will be crucial to this system, preventing efficiency from dropping rapidly as the number and variety of robots increase.

Proposed solutions

RoboNimbus' goal is an AI-powered, cross-domain management system for robots, realised as a technology stack with an 'Anything-as-a-Service' (XaaS) cloud model. Multi-robot coordination and human augmentation sit at the top of this stack, while a specially-designed agent will be installable on standard robots to allow communication with the platform. This management system will select robots according to their capabilities, position and availability for the task at hand and will also monitor their health parameters.

Other innovations include context-based simultaneous localisation and mapping (SLAM) to reduce computational complexity, smart vision AI for more accurate face and object recognition, AI markup language to implement

voice commands and smart motion AI based on data from integrated sensors. RoboNimbus proposes on-premises cloud management to solve issues of high bandwidth, uninterrupted analysis and privacy compliance and will demonstrate this with various use-cases in healthcare. The project will then expand into other domains following completion.

on operating costs for a hospital's emergency department and 25% for aircraft maintenance; it also contributes to international competitiveness in locations where labour costs are high.

Crucially, RoboNimbus facilitates all this in an emerging but fast-growing area: the global robot software market, valued at USD 1.59 billion in 2018 and expected to reach USD 32.24 billion by 2026 at a compound annual growth rate of 45.7%. This is a significant advantage for SMEs as they can acquire a large market share without competition from established players.

Image caption for project related image

Projected results and impact

Through the RoboNimbus platform, autonomous robots will be able to improve operational speed and accuracy while automating tasks that run a risk of employee injury. This also allows workers to be more efficient and enables options such as continuous training in the workplace.

From a business perspective, automation could save as much as 10–15%

By making its interoperable platform available to the vast majority of small-scale vendors, RoboNimbus aims for a robotic revolution comparable to the earlier societal impact of mobile technology.

Cyprus

SAMARATUG
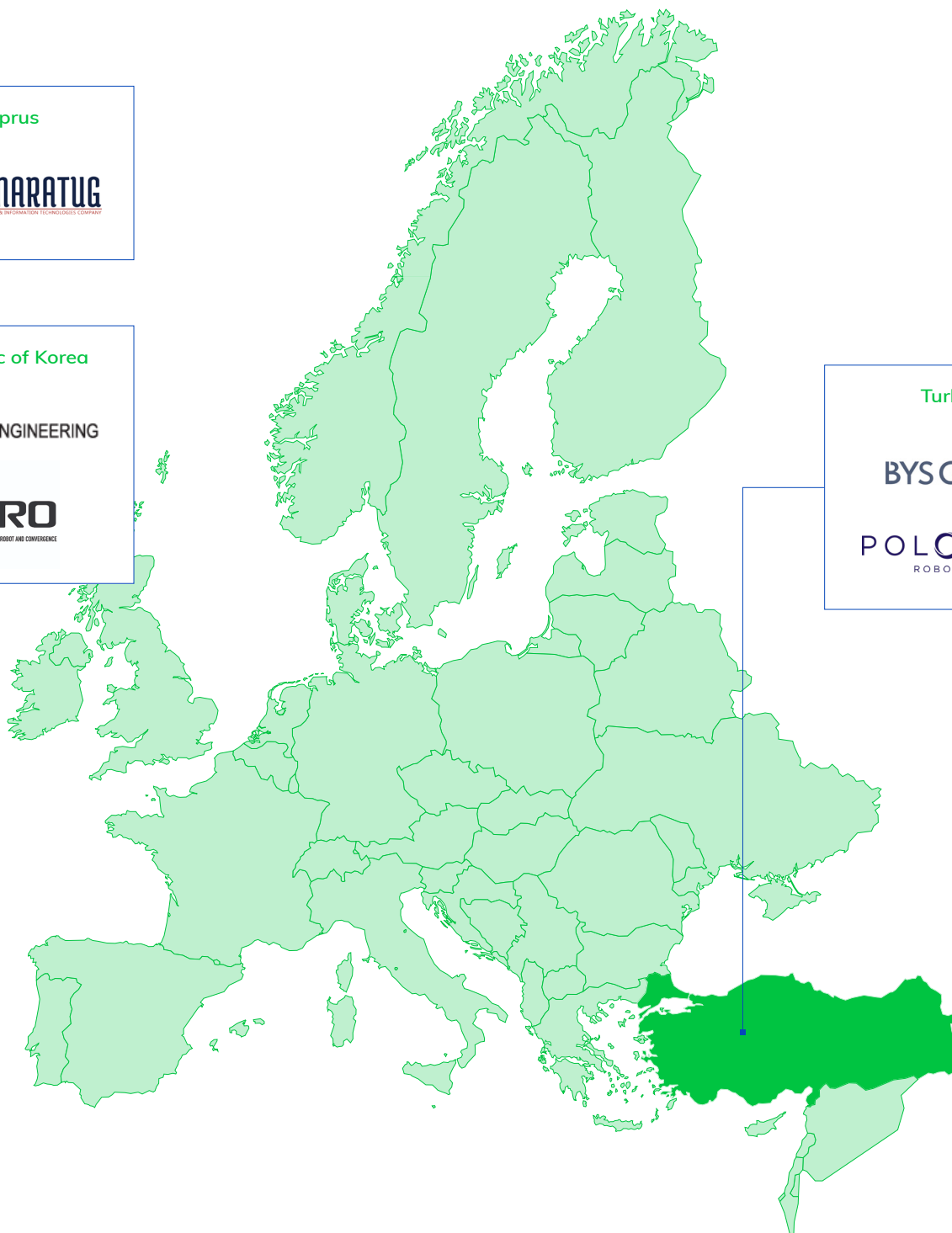SPACE, AVIATION & INFORMATION TECHNOLOGIES COMPANY

Republic of Korea

G·E·S ENGINEERING

KIRO
KOREA INSTITUTE OF ROBOT AND CONVERGENCE

Turkey

BYS GRUP

POLONOM
ROBOTICS

Project start
January 2021

Project leader
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Project website
https://itea4.org/project/robonimbus.html

Project end
December 2023

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