PHENIKAA UNIVERSITY | XPHENIKAA

GLOBAL PARTNERSHIPS FOR ROBOTICS INNOVATION

BRIDGING RESEARCH, TECHNOLOGY TRANSFER AND COMMERCIALIZATION



Assoc. Prof. Dr. Le Anh Son
President, Phenikaa University
CEO, Phenikaa-X

THREE COMMERCIALIZATION BOTTLENECKS

A robot combines sensors, chips, AI, precision mechanics, safety rules and a market in one machine. No single lab, company or country masters the whole chain.

01

Research to application

Many strong research results, but few environments in which to validate them and mature them into products.

02

Technology to market

Limited resources for product engineering, standardization, certification, manufacturing and customer access.

03

Collaboration to commercialization

Universities, institutes, companies, regulators and funders have not yet formed one continuous chain.

Good technology is not enough. Robotics needs an ecosystem that connects research, engineering, manufacturing, finance and markets.

ONE ECOSYSTEM HOLDS EVERY LINK OF THE CHAIN

PHENIKAA Our commitment. Your reality

2010 founded

30+ member companies, incl. in the USA and Canada

4,500+ employees

EDUCATION AND TALENT

Phenikaa University

Engineers, scientists and high-tech talent from undergraduate to PhD.

RESEARCH AND R&D

Institutes and research centers

Fundamental and applied research; development of core technologies.

PRODUCT DEVELOPMENT

Phenikaa-X and technology units

System integration, product development and testing, with 360 full-time staff.

MANUFACTURING AND MARKET

Group member companies

Industrial capacity and first customers, such as Vicostone and PhenikaaMec.

One open foundation: international partners - enterprises - funding agencies - regulators

PHENIKAA UNIVERSITY: FROM PAPERS TO PRODUCTS

>1,200
staff members and lecturers

>50%
PhD holders

15%
professors and associate professors

>140
laboratories

12 + 20
leading and potential research groups

80%
of publications with international collaboration

No. 1 in Vietnam, Nature Index 2025

THE Awards Asia 2026: Leadership and Management Team of the Year, the first Vietnamese winner

9 start-ups and spin-offs established; 120+ partner universities worldwide







ONE TRACEABLE EXAMPLE

Publication
3D LiDAR detection on Vietnamese streets (IEEE T-ITS, 2024); HD-map accuracy in Hanoi (Springer, 2023)

Patent
Personal 3D map data collection device, co-owned by Phenikaa University and Phenikaa-X

Transfer
Formal transfer to Phenikaa-X, the University's spin-off; inventors hold equity

Product
HD map and localization stack running in Phenikaa-X vehicles and robots

THE GROUP IS OUR FIRST CUSTOMER

1

Research

University labs and PhD research

2

Technology

Phenikaa-X autonomy and robotics stack

3

Product

Campus test sites and an ISO 3691-4 test lab

4

Deployment

Group companies as first customers

5

Global scaling

Customers in Japan, Korea and Luxembourg



NEO robot calling a KONE elevator, PhenikaaMec

PROVEN INSIDE THE ECOSYSTEM FIRST

PhenikaaMec hospital: NEO robots deliver medicines from the pharmacy to every ward, calling KONE elevators through an API.

Vicostone factories: Smart factory automation and internal logistics for a global engineered stone manufacturer.

Phenikaa factory, Hoa Lac: Test field for autonomous industrial vehicles with payloads up to 4,000 kg.

University campus: Autonomous minibus routes, digital twin simulation and the PHX Smart School platform.

From first customer to reference customer: PhenikaaMec opened the door to Bach Mai, Hanoi Medical University, Saint Paul and Bai Chay hospitals; industrial references now include Samsung, Nichirin and VinFast.

PHENIKAA-X: SIX YEARS OF PROOF

2020

Founded

Spun out of the research teams of Phenikaa University and Phenikaa Group to turn autonomy research into products.

2021

Vietnam's first Level 4 vehicle

Unveiled at an international workshop co-organized with Nagoya University, METI and AOTS of Japan.

2024

A global industrial customer

AMR Pallet Mover in service at Samsung Electronics Thai Nguyen (SEVT) since July 2024.

2026

A pioneering sandbox

Four autonomous vehicle types operating on shared roads in Hoa Lac under Hanoi's sandbox.

BUSINESS

3	countries with overseas customers: Japan, Korea, Luxembourg
~90	economic contracts signed (by January 2025)
~25	MoUs and NDAs with R&D partners

SCIENCE: PATENTS AND PUBLICATIONS

1 — **US patent**
US 12,637,068 (2026): safety control system on narrow roads for self-driving delivery vehicles.

4 — **Vietnamese patents, co-owned with Phenikaa University**
Outdoor autonomous robot system and control method; autonomous electric vehicle system; personal 3D map data collection device; mobile robot cluster.

23 — **Scientific publications since 2020**
IEEE Transactions on Intelligent Transportation Systems, Neurocomputing, Transportation Letters, Transportation Research Interdisciplinary Perspectives and Springer proceedings.

WE OWN THE CORE; PARTNERS ADD THE BEST

Capability	Key evidence	How we build it
Perception and AI	Detection and tracking up to 200 m; up to 300 objects per frame at 60 FPS; trained on our own GPU cluster (8× NVIDIA A100 and H200)	**In-house**
Localization and HD mapping	PNKX-Loc LiDAR localization below 10 cm outdoors; XLoc v2 for indoor robots: ±10 mm, 0.1°, 100 Hz; HD maps for GPS-denied areas	**In-house**
Planning, control and drive-by-wire	Sensor fusion, trajectory planning and vehicle control; own vehicle control unit and brake-by-wire	**In-house, on partner sensors**
Robot control and fleet management	PNKX-RCS real-time robot control; PNKX-RFM fleet manager for up to 200 robots, VDA 5050-oriented, ERP/WMS and KONE elevator links	**In-house**
Simulation and certification	X-Sim for virtual safety validation; CE and ISO 3691-4 certification pathway with TÜV SÜD	**In-house, with TÜV SÜD**

INTEGRATED FROM PARTNERS

SICK Sensor Intelligence. NVIDIA intel VINFAST HYUNDAI

OUR ROBOTS IN REAL OPERATION



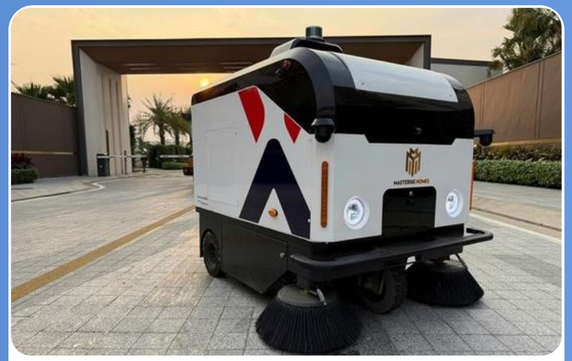
Autonomous vehicles

SAE Level 4 minibuses (4–16 passengers) and retrofit robotaxis for smart cities, campuses and industrial parks.



Industrial logistics robots

AMRs and forklift robots from 150 to 1,000 kg for material transport and factory automation.



Autonomous cleaning robots

Level 4 sweepers on our own drive-by-wire chassis for industrial parks, urban areas and service zones.



Drones and service robots

Drone-in-a-box with VTOL aircraft flying up to 100 km per mission; NEO service robots for hospitals and buildings.

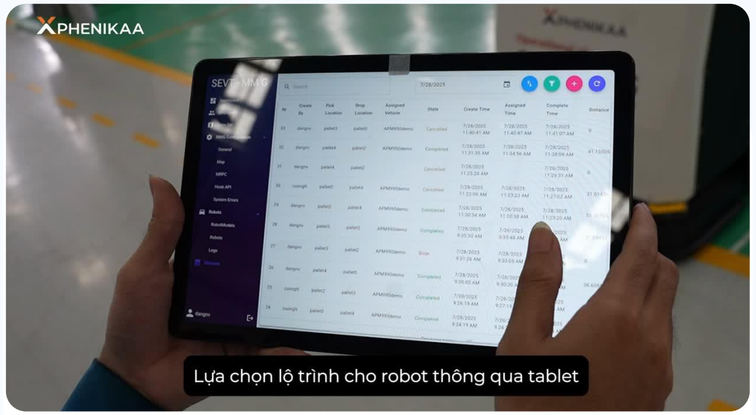
4,500 m²
production space for vehicles and robots

200 m
perception range

100 km
autonomous flight per drone mission

±10 mm
indoor robot localization

PROOF OF TRANSFER: THREE CASES



Logistics robots

TRL 9 - commercial operation

NEED Heavy pallets moved by hand across shifts at Samsung Electronics.

SOLUTION AMR Pallet Mover: 1,000 kg payload, LiDAR SLAM, fleet control.

DEPLOYMENT SEVT Thai Nguyen since July 2024; AMR T800 at SEHC, Ho Chi Minh City.

VALUE 150-200 journeys over two shifts; 6 delivery roles automated; 2-minute battery swap.



Autonomous vehicles

TRL 7-8 - small-batch production

NEED Safe mobility in dense, motorbike-heavy mixed traffic.

SOLUTION Level 4 minibus and retrofit robotaxi; VinFast VF8 to first autonomous run in ~4 weeks.

DEPLOYMENT Becamex Binh Duong, Ecopark and Thu Duc; Hoa Lac sandbox.

VALUE Small-batch robotaxi production under contract with VinFast.



Autonomous sweepers

TRL 7-8 - pre-commercial

NEED Labour-intensive cleaning of parks, campuses and smart cities.

SOLUTION Level 4 sweeper with LiDAR and HD map on our own drive-by-wire chassis.

DEPLOYMENT Hanoi's 24-month Hoa Lac sandbox.

VALUE Proposed as a national strategic product; first batch in preparation for public use.

Each case followed one path: real need → own technology → product development → field deployment → measurable value

FROM ONE LAB TO A FAMILY OF COMPANIES

Spun out

PHX Smart School

School management platform: 30,000+ users in 20+ schools.

Spin-off 2026

Phenikaa Robotics

AI-native industrial robots, AMRs and an AI forklift retrofit kit.

Spin-off 2026

NEO Robotics

Service robots for hospitals, hotels and buildings.

Spin-off 2026

PHX Smart Hospital

Hospital management platform with AI and a data lake.

Restructuring 2026

Phenikaa MaaS

Intelligent transportation and mobility services.

Incubating

XGeni

No-code enterprise AI agents, on cloud or on premise.

Phenikaa-X works as a Future TechLab: it incubates each technology until the team, market and revenue are strong enough to stand as its own company. Founders and inventors hold equity; strategic partners can invest in the spin-off that matches their business.



MANUFACTURING: 4,500 M²

Vehicle integration line, ~2,000 m²: 100-200 autonomous vehicles per year, 2026-2028.
Robotics workshop, 2,500 m²: 300-500 indoor AMRs and 200-300 outdoor chassis per year.
Test laboratory, 500 m²: ISO 3691-4 safety testing, toward CE marking for export.

REGULATORS AS PARTNERS: HANOI SANDBOX

24

months of operation in Hoa Lac Hi-Tech Park and the VNU Hoa Lac area

4

vehicle types: autonomous buses, robotaxis, sweepers and delivery robots

30,000

km of autonomous operation targeted as evidence for certification

Decision No. 4554/QĐ-UBND of the Hanoi People's Committee, 25 August 2026 - launched 10 September 2026



VIETNAM AS A GLOBAL TESTBED

"If it works in Hanoi traffic, it works anywhere."

Extreme complexity	Dense mixed traffic full of motorcycles demands accurate perception, fast computing and flexible decisions.
Speed of iteration	Campus test sites, a hi-tech park and a legal sandbox take new software from simulation to the road quickly.
Competitive engineering	Strong engineering talent and a growing manufacturing base keep development and integration costs competitive.

EVERY MILESTONE CAME FROM A PARTNERSHIP

JAPAN

Nagoya University - METI - AOTS

Co-organized international workshop and driver-safety research

Result
Vietnam's first Level 4 vehicle unveiled, 2021

JAPAN

Hiroshima University

Joint research on shared autonomous vehicles for first- and last-mile mobility

Result
Transportation Letters (2026); TRIP (2025)

JAPAN

Nippon Koei - Becamex Tokyu

Autonomous vehicle trials in Binh Duong smart city

Result
Minibus deployments in Binh Duong, Thu Duc

KOREA

Samsung Electronics

AMR solutions co-deployed at SEVT and SEHC

Result
TRL 9 operation; AMR 250 exported to Korea

EUROPE

TÜV SÜD - Customer in Luxembourg

Certification pathway for CE and ISO 3691-4; robotics customer in Luxembourg

Result
A pathway to EU markets

ASIA

Toyota Tsusho - Restar

AI forklift kit pilot in Thailand; environmental monitoring drones

Result
Regional pilots beyond Vietnam

TECHNOLOGY PARTNERS

FOUR JOINT PROGRAMS WE PROPOSE

01

Joint Robotics Research Program

AI, autonomous robots, perception, control and next-generation robotics.

We bring Labs, PhD talent and real driving datasets

We seek Co-investigators, complementary labs, joint PhD supervision

02

Joint Technology and Product Development

Shared R&D resources, solution integration and market-driven products.

We bring Our autonomy stack and integration factory

We seek Component, platform and co-engineering partners

03

International Robotics Testbed

Real-world test environments for industrial robots, service robots and autonomous vehicles.

We bring Hoa Lac sandbox, campus and factory sites

We seek Technologies to validate, shared test protocols and data

04

Joint Commercialization and Market Access

Manufacturing, distribution, technology transfer and international market development.

We bring First customers in the Group and access to ASEAN

We seek Distribution, manufacturing and investment partners

Starter projects: open Vietnamese mixed-traffic dataset challenge - shared AV first/last-mile pilots - ISO 3691-4 validation of AMRs

WHAT FUNDING AGENCIES CAN UNLOCK

Robotics in bilateral calls

NAFOSTED and partner funds co-financing Vietnamese and foreign teams on one shared challenge, with industry involved from the start.

Open testbed access

Support for international teams to use sandboxes, datasets and simulators, so evidence is built once and shared.

Mobility of people

PhD students and engineers embedded in partner companies and laboratories across borders.

First deployments

Co-funding pilots and early procurement, so research reaches TRL 9 instead of stopping at TRL 6.

Fund the bridge, not only the two banks.

PROPOSED: PHENIKAA GLOBAL ROBOTICS INNOVATION PARTNERSHIP

Months 0–3

Connect partners, select problems and research teams.

Result **Priority joint projects**

Months 3–12

Joint research, prototypes and joint funding applications.

Result **Joint R&D projects and prototypes**

Months 12–24

Field testing, product maturation and commercialization.

Result **Products in use, market partnerships**

PHENIKAA UNIVERSITY | XPHENIKAA

“We are not simply looking for technology partners or customers. We are looking for partners to jointly create, develop, validate and commercialize the next generation of robotics technologies.”

THANK YOU

phenikaa-uni.edu.vn - phenikaa-x.com

contact@phenikaa-x.com

Assoc. Prof. Dr. Le Anh Son, President, Phenikaa University

