



Pushing AI frontiers and Innovation in Vietnam

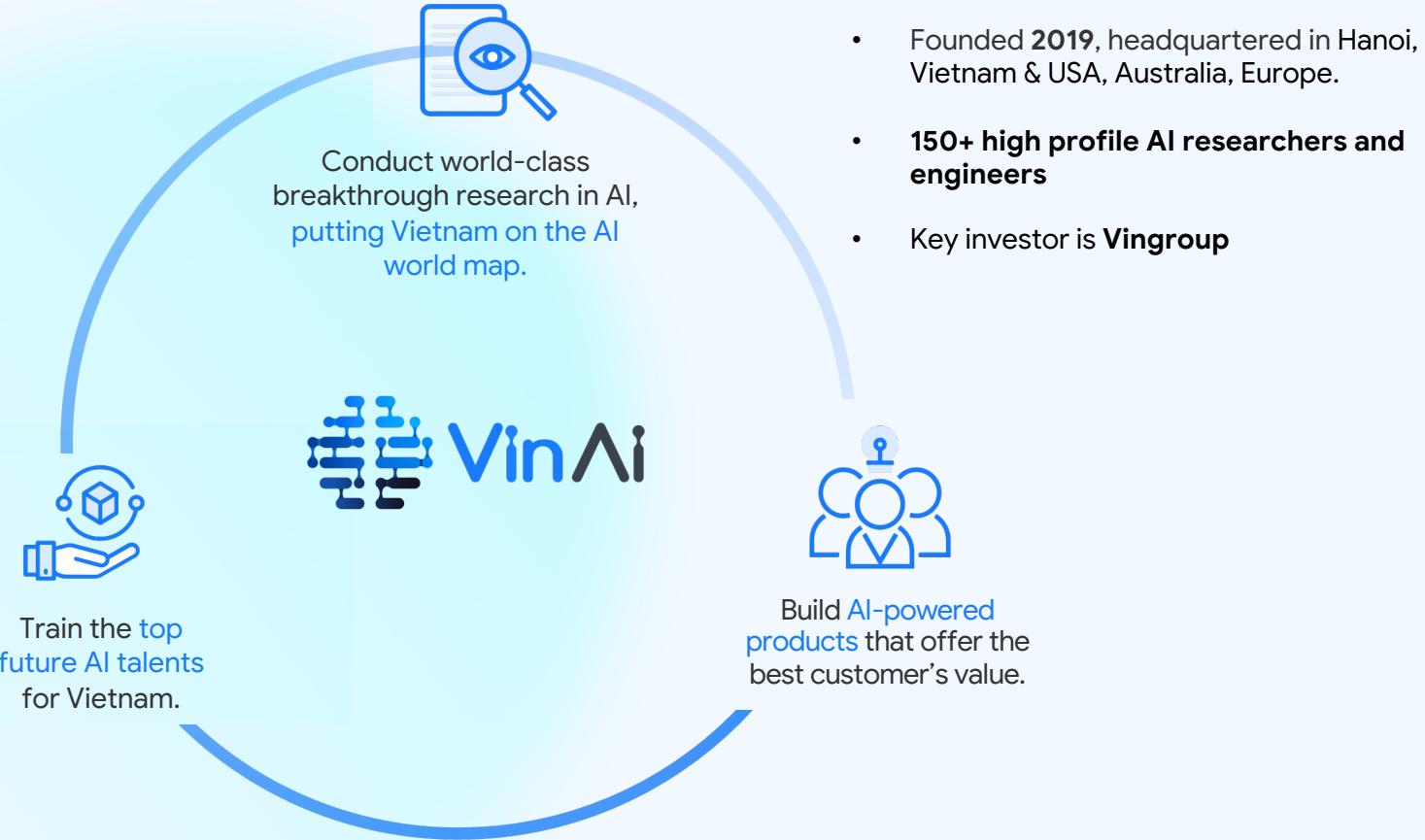
The Story of VinAI Research

Linh Pham – Program Manager, VinAI

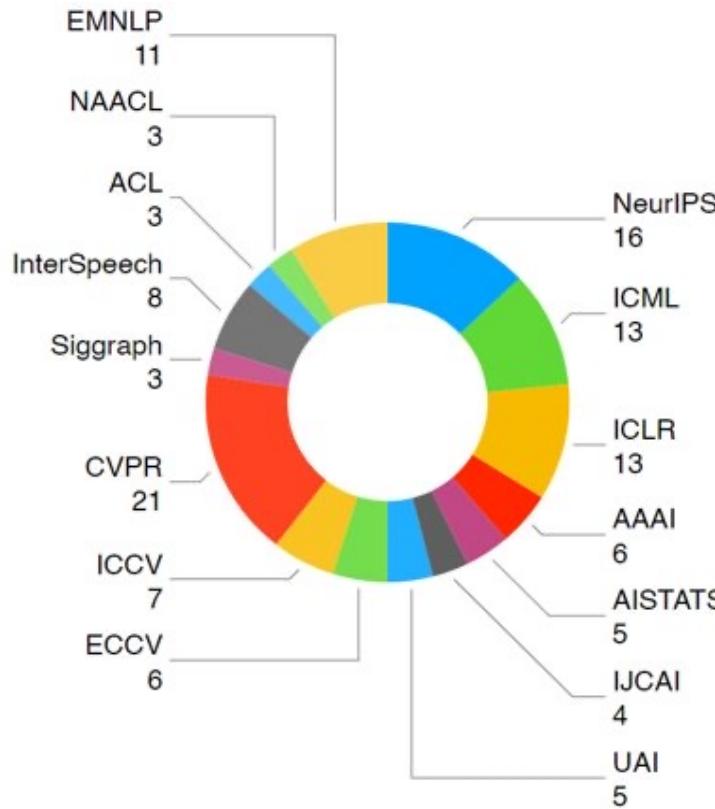
Our Story



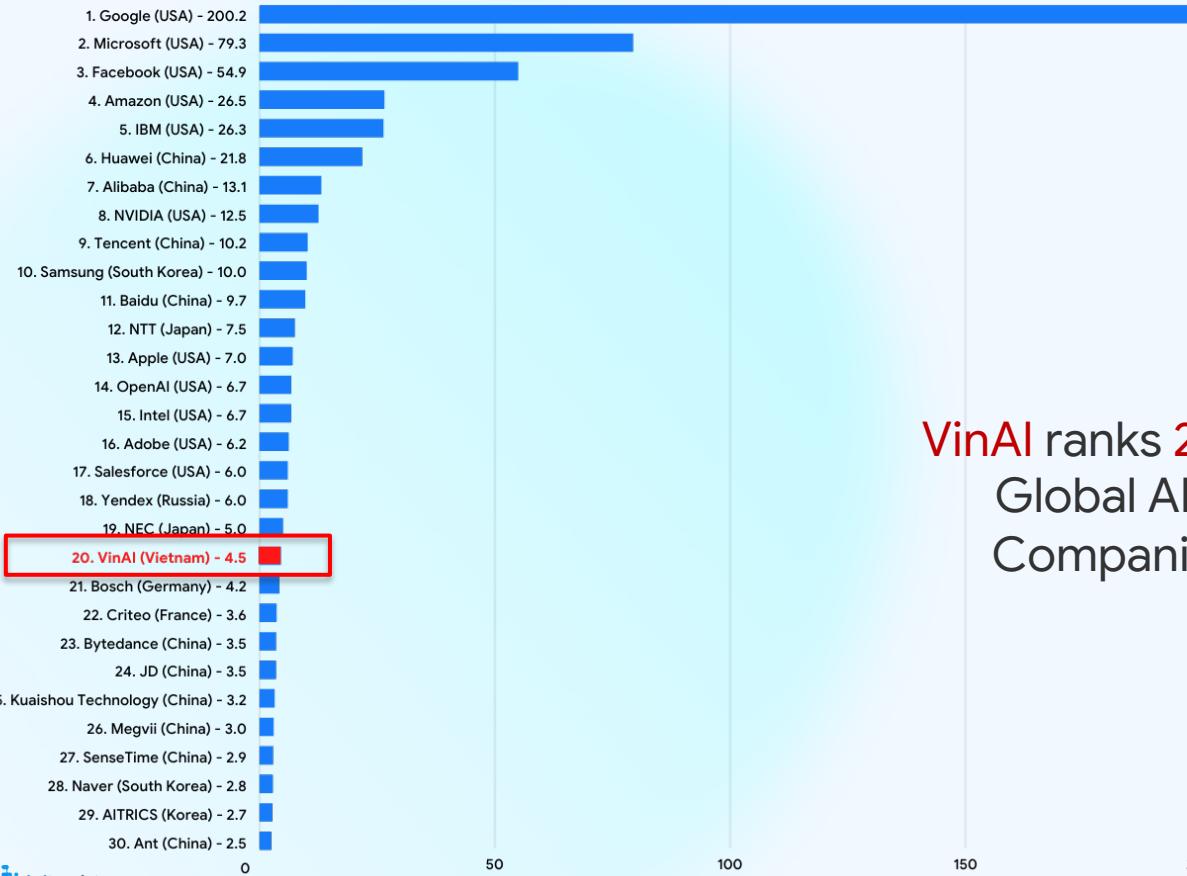
Three Missions



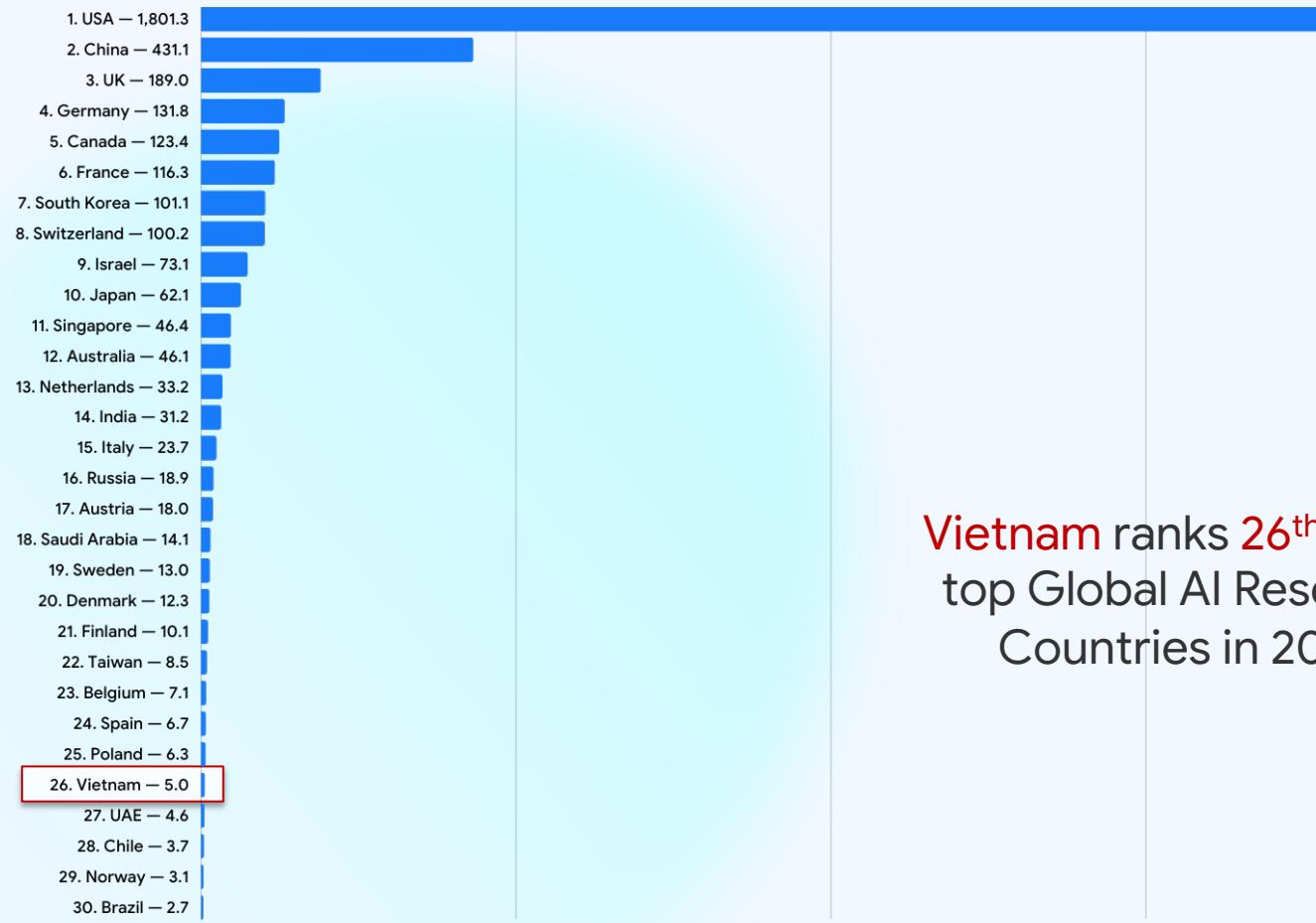
Our Exceptional R&D Capability



Our World Class AI Research



VinAI ranks 20th in the top Global AI Research Companies in 2022



Vietnam ranks 26th in the top Global AI Research Countries in 2022

Core Research Group

to disrupt the status quo

Machine & Deep Learning

- Leader in optimal transport for machine learning
- Pushing frontier in **human-level learning capabilities** (self-supervised, domain adaptation, learning with less label)
- **Generative AI** in vision and language
- Theoretical core to AI products

Computer Vision

- Face ID and Camera Under Display (CUD) technology deployed in millions of Vsmart phones in VN
- 3D Vision, robust AI, few-shot problems, image restoration and enhancement
- Pioneering **mobility AI** for DMS, SVM, Edge

Natural Language Processing

- LLMs
- **#1** Vietnamese machine translation system
- **#1** toolkit for core NLP tasks
- Large scale language models for Vietnamese (PhoBERT, BARTPho, **100k download** per month)

Talent - AI Residency Program

The First and Most Prestigious AI Residency Program in Vietnam

To exploit the vast yet untapped talent pool in Vietnam, and nurture the next generation of AI experts and leaders

100 Recruited talents
belonging to top 1% AI talents in
Vietnam

~6% acceptance rate in each
recruitment batch



World-class training &
mentorship



67 Accepted papers

At top-tier conferences
including NeurIPS, ICML, ICLR, CVPR,
ACL, EMNLP, etc.



47 Ph.D. students

Now in USA, UK, Ireland, Germany, UAE,
Singapore, Australia.

97 Ph.D scholarships granted from the
world's top 20 CS universities



45 File patents

Our Alumni Spanning Across the Globe

57 Graduated alumni
Now being Ph.D students, AI Engineer, AI Researchers, entrepreneurs,...

26 Universities worldwide
Offered Ph.D. scholarships

VinAI Affiliation program

Offer research collaborations between alumni and VinAI

Alumni Association

Strengthen global research connections

AI Research Insider

A community for AI Research young talents in Vietnam



Community Outreach

- **4** AI Day Annual Events (2019, 2020, 2021, 2022)
- **6** Live Conference Paper Workshops
- **58** Live Expert Seminars
- **36** Released Source Codes
- **15** Released Datasets
- **35** Technical Blogs
- **18** Technical Talks / Public Lectures
- **3** AI Competitions (AI Challenge 2021 - Vietnamese Scene Text Recognition, WNUT 2020, ChEMU 2020)

AI Day & Workshops



Local University Collaborators



Our People

Our team includes **22 Ph.Ds, 20 MSc, 46 AI Researchers** and a total of **76+ engineers** with deep expertise in AI Optimization, GenAI, Deep Learning, Computer Vision, NLP, Automotive, Software/AI Engineering, Project/Product Management and an average of 5+ years of experience in building AI-powered products.

Our experts previously came from big tech players such as Google Deepmind, Adobe, Bosch, Audi, Toyota, Renesas, CMU, Monash University, SRI, Nuances.



Hung Bui (Ph.D)
Founder & CEO

20+ years experience in AI, Deep Learning. Former Google DeepMind, Adobe, Stanford Research Institute
Led project that spun-off Apple Siri



Dinh Phung (Ph.D)
VP Research & Data Science

20+ years experience in deep machine learning research and AI product developments
Professor in AI & DS, Monash
Former AI Chief Scientist, Trusting Social



Hoai Nguyen (Ph.D)
Principal Research Scientist

15+ years experience in computer vision and human behavior analysis
Assoc. Professor at SUNY Stonybrook, US
Ph.D. CMU, Postdoc Oxford



Anh Tran (Ph.D)
Senior Research Scientist

10+ years experience in Computer Vision, Generative AI and Machine Learning
Former Applied Scientist, Amazon AWS
Ph.D. University of Southern California



Dat Nguyen (Ph.D)
Senior Research Scientist

10+ years experience in LLM and NLP, Machine Learning
Former Research Fellow, The University of Melbourne;
Ph.D. Macquarie University (with **Mark Johnson**, Chief AI Scientist, Oracle)



Khoi Nguyen (Ph.D)
Research Scientist

8+ years experience in Computer Vision and Generative AI, Machine Learning;
Ph.D. Oregon State University (with Prof. Sinisa Todorovic) VEF Fellow Cohort 2015

From Research to Applications

Our Products

We solve real-world problems by transforming state-of-the-art AI research into impactful solutions and services.

Smart Mobility

Next Level of
Safety & Comfort



Smart Edge

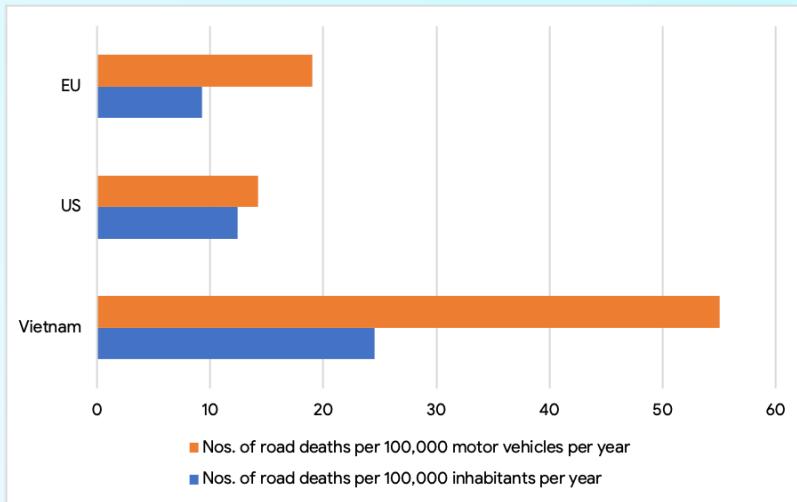
Efficient Edge AI
Camera and Analytics



From Research to Products that Save Lives

Globally, 1.3 mil people die in car accidents annually

Death tolls comparison*



Vietnam has a significant high accident rate

Major causes of accidents



Lack of attention



Blind spots



Drowsiness



Drunk driving

Our Smart Mobility Products

Next Level of Safety and Comfort, Powered by AI



In Cabin: Driver and Occupants Monitoring System (DMS)
Prevent problems caused by driver inattentiveness, drowsiness,
drunken state and forgotten children/pet in vehicles.
Provide new incabin comfort and convenience.



Around the vehicle: Advanced Surround View Monitoring System (ASVM)
Prevent problems caused by limited exterior visibility.
Provide precise perception input for low-speed autonomy.

Driver and Occupants Monitoring System (DMS/OMS)

Features



Fatigue and Drowsiness Monitoring (EU compliance)



Attentiveness Monitoring



Phone Usage Detection

Core AI Technologies

- Eye State Detection
- Landmark Detection
- Eye Gaze Tracking
- Head Pose Tracking
- Behavior Detection



Driver & Occupants Monitoring System

<https://youtu.be/HCGaBqZHPY?t=8>

360 Advanced SVM

Features

- Real-time 3D View
- Tire View, Front View and Rear View
- Top View with Trajectory Guideline

Core AI Technology

- Video/Image Enhancement
- Video/Image Blending and Fill-in
- Depth Estimation



Advanced Surround View Monitoring

<https://youtu.be/tqH6cFEgT1c?t=7>

Our Smart Edge Solution

 **guardpro** turns regular IP cameras into a wholistic AI system that enhances

Safety

- FaceID for Access Control
- Blacklist/Whitelist Detection
- Intruder Detection
- Person Reidentification
- Fence Jumping Detection
- Violence Detection
- Harassment Detection
- Loitering Detection

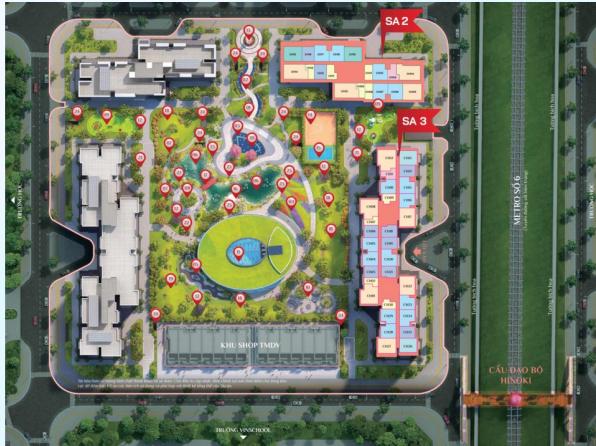
Compliance

- Parking Violation Detection
- Face Mask Policy Violation Detection
- Abandoned Item Detection
- Unallowed Object Placement Detection
- Bulky Object Detection in Elevator
- Uncovered Truck Detection
- Pet Detection
- Littering Detection

Convenience & Wellbeing

- Vehicle Localization by license plate number
- Available Parking Spot Localization
- Convenient Access to swimming pools and playgrounds without carrying resident cards
- Fall/Unconsciousness Detection

Case study: Smart City project for VinHomes



- Deployed **9 AI features** on **9.000 video streams** for VinHomes' residential area.
- Seamlessly integrated with customer's CMS platform.
- Saved **35% of hardware investment cost**.

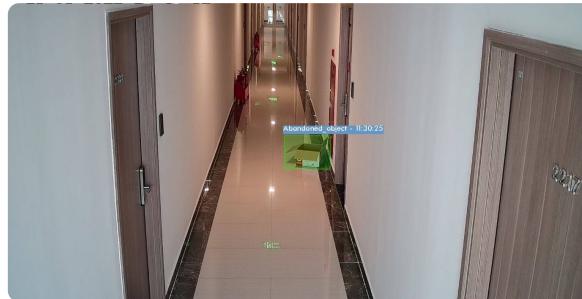


Deployed Customer's Use Cases

Access Control based on Face Recognition



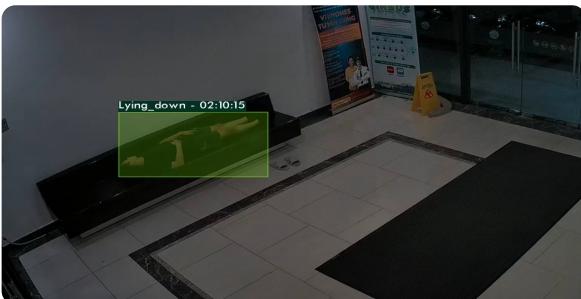
Unallowed Object Placement in Hallways



Oversized Objects in Elevators



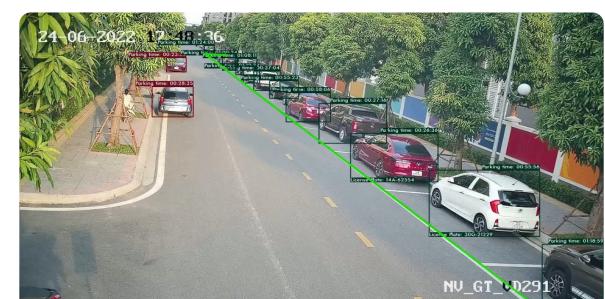
Fall & Lying Detection



Fence Jumping Detection



Parking Violation Detection



Conclusion

- Started with an ambitious AI mission for Vietnam – not sure was possible
- Three lessons learned:
 - Invest in R&D so not to fall behind
 - Train, and leverage the smart tech workforce
 - Pick a problem that has high commercial value
- What's next?
 - Vietnam is 15th world most populous country with enormous untapped potential (100m, 65% young, excellent STEM background)
 - It was ‘untested’ before - we hope to have shown some lights to unlock
 - To the world: ripe and ready to partner, co-invest, collaborate in AI talents, research, products



Thank you!



<https://www.vinai.io/>