



AI ACADEMY VIETNAM

June, 2023



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Solutions & Products

Nature Language Processing, Computer Vision, Optimization fields

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AI product/solution development process

Customer-oriented

04

Human resource competence

Highly experienced

About Us

AI Academy Vietnam is the first non-state owned institution in Vietnam specialized in training, research and development in Artificial Intelligence (AI), Data Science (DS), Information Technology (IT) and Automation.



Provide training programs in the fields of AI, Data Science & Digital Transformation



Consult and transfer knowledge related to AI, Data Science & Digital Transformation



Research and develop products in the fields of AI & Big Data Analytics



Organize events associated with AI, Data Science & Digital Transformation.

We are proud to be in the top 10 AI organizations in Vietnam recognized by Ministry of Science & Technology and the Ministry of Planning & Investment in August 2018 in the event series that connected 100 top Vietnamese scientists working in the fields related to Industrial Revolution 4.0.





Our Teams

01

EDU

AI, Big Data, Digital Transformation for CEO/CTOs
AI Engineers, Data analysts
AISTEAM for highschoolers/students

02

NLP

News Collection, Summarization, Classification
Feature extraction
Entity tracking and relational representation
Machine translation

03

CV

Identification people/objects (ID, driving license)
Recognition of human actions and gestures.
Vehicle and traffic monitoring
Smoke and fire monitoring

04

DATA
OPT

Production planning
Resource scheduling
Vehicle routing problem
Data analysis

Our Core Capacities



1. Centralize and handle big data

- Integrating multiple operational systems, databases
- Data cleaning
- Intelligent data modeling and optimal data storage to facilitate advanced analysis and AI/ML/OPT solution deployment.



2. Develop complex technologies to deliver effective solutions

- Our experts have knowledge, skills and experience in Computer Vision, Nature Language Processing, Data Analysis, and Optimization fields to propose highly practical AI solutions.



3. Provide complete solutions under one roof

- Data warehouse
- Core tools: Optimization tools/AI models/...
- Web/App
- Visualization/BI report



4. Committing to accompany

- Support, maintenance
- Diagnostic analytics, consulting services

Our Achievements

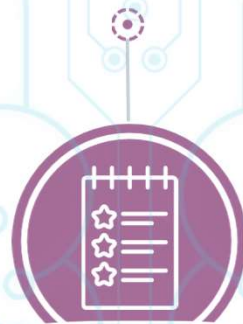
★
20+ Top VN500 Enterprises have been franchised and used our AI training programs/ services



★★★
Consult the AI strategy, big data building & application strategy, E-government & smart city for Vietnam Ministry of Natural Resources and Environment, Minh Phu Group, PMC, NAPAS, TP Bank.



★★★★★
Provide valuable AI solutions to top domestic companies such as Vin group, Viettel, TP bank, EVN Vietnam, Ministry of Natural Resources & Environment and foreign companies such as TEL, Sony Japan



★★★
1600+ CEOs/ CTOs have taken part in the training programs on AI, Big Data & Digital Transformation conducted by AI Academy Vietnam



★
1500+ AI Engineers, Data Engineers have been trained at AI Academy Vietnam



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MARKET SENSING AND ANALYTICS



Project description

Automatic collection of data from various sources in cyberspace. They are represented, classified, and analyzed according to the market value chain, location, and competitors (Multi-lingual news summarization, market forecasting, and market risk analysis)



Customer

They are the number one in Vietnam and leading seafood company in the world. Their products are currently available in more than 50 countries and territories, with turnover of over 500 hundred millions of USD per year.



Industry

Seafood industry



Completion time

10 months



Typical results

- Collection and analysis of news in 4 languages
- Creation of analytic scenarios via drag-and-drop that are easy to use and evaluate.
- Connection of market analysis with enterprise internal data to increase competitiveness.
- Display analytic scenarios with data, news visualization, and sentiment analysis in a storytelling manner.
- Reduce 80% of the execution time, and 20% of the workforce for this task compared to before applying our solution.

Limitations

- The solution requires massive parallel analysis systems or powerful machines able to handle a big workload.



“The system provides AI and Big Data based solutions to the problem of vertical market sensing and analysis via market news and data analytics. It produces reports, summarizations, analyses, evaluations, forecasting of the vertical market according to value chain, geographical location, customer, and competitor. The system also supports analytics on internal enterprise data in parallel and comparison with market data, analysis, and forecasting, which helps the enterprise leaders to make smart and in-time decisions with deep understanding of market current and future situations .”

SEMICONDUCTOR MATERIAL RECOGNITION



Project description

Given an image dataset (including labeled images), we measure the details of semiconductor circuits to check product quality.



Customer

Our customer is best known as a supplier of equipment to fabricate integrated circuits (IC), flat panel displays (FPD), and photovoltaic cells (PV) - Tokyo Electron Device. They are the largest manufacturer of IC and FPD production equipment from 2011.



Industry

Semiconductor industry



Completion time

6 months

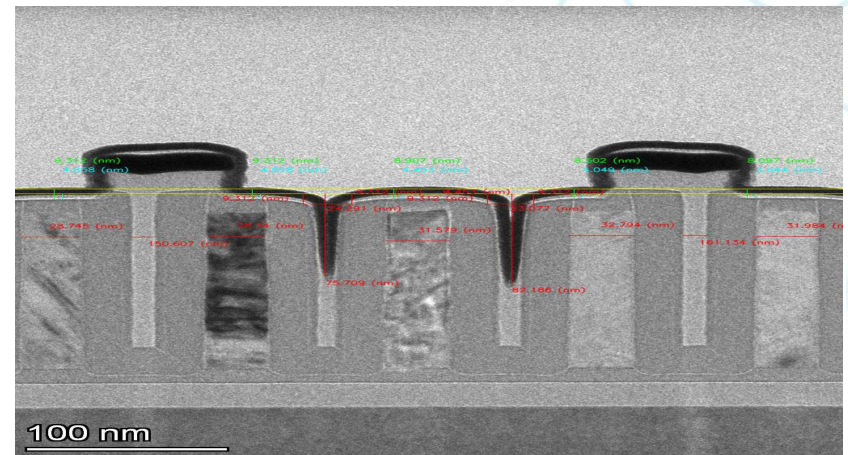
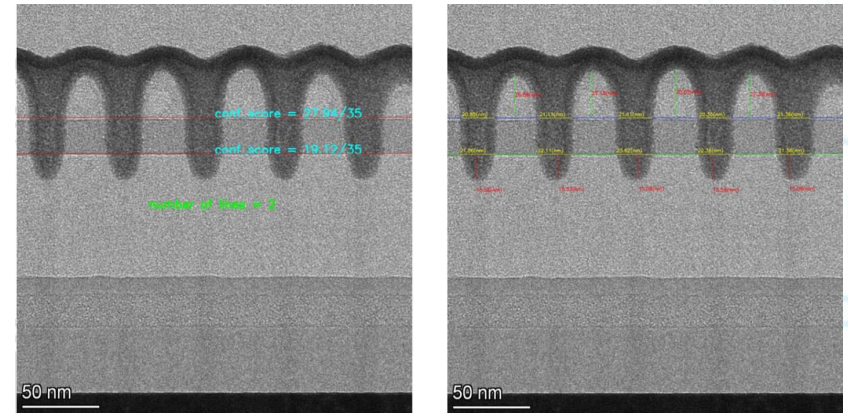


Typical results

- Solving several main challenges for training AI: highly noisy, low texture/contrast, high inter-class similarity, unbalanced data (R,G,B) and limited in quantity..
- Recognition accuracy up to 99%
- Reduce 25-40% of the QC time

Limitations

- We only provide core solutions on request, we don't know how they use it clearly. We believe that we can solve this problem better if we know the complete production process.



“The system provides Computer Vision based solutions: classifying semiconductor materials, detecting and classifying components of color Iter SEM images for semiconductor products, and measuring the details of semiconductor circuits to check product quality. Data is variety of types, and noisy, low-contrast data. Our solution helps to reduce inspecting time and increase reliability in the acceptance of semiconductor products..”

Intelligent Traffic System (ITS)



Project description

Developing a multi-stream video processing solution that recognizes license plates, detects vehicles, speed and traffic incidents or automatic toll collection on highways



Customer

They are a leading corporation in Vietnam, specializing in consulting and developing information and communication technology solutions. The main fields of their investment include intelligent transportation systems, electronic toll collection, e-government,...



Industry

Transportation



Completion time

6 months

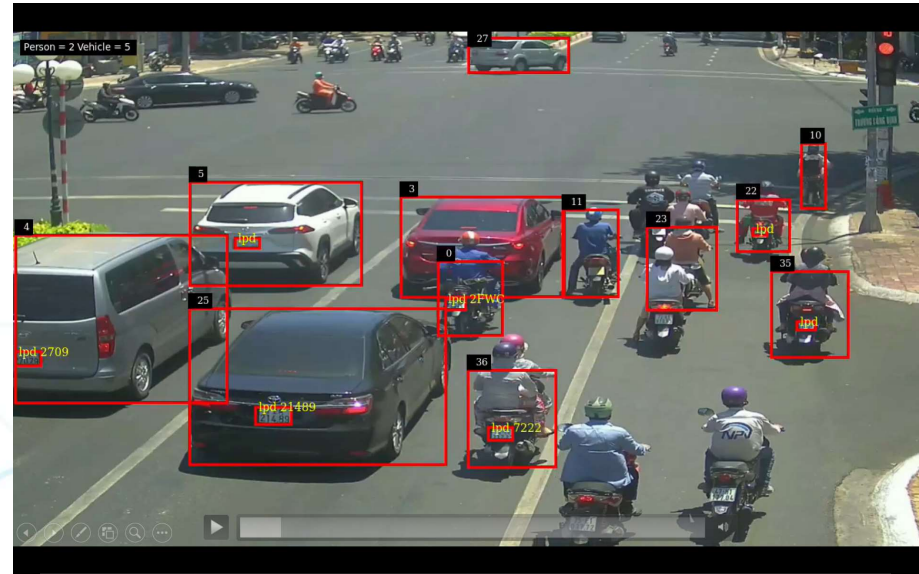


Typical results

- Save 30% on server investment costs by processing techniques on multiple video streams
- Optimizing processing time for data analysis and processing
- Multi-tasking of object tracking, number plate, color, and type recognition.
- Recognition accuracy up to 97%
- Fully deployment tools (web app, mobile app) to support users for convenient and effective usage.

Limitations

- The solution quality has not really satisfied our expectations due to the short development time required.



“The system provides Computer Vision based solutions to the problem of vehicle recognition. Our solution can perform multi-tasks of object tracking, number plate, color, and type recognition via multiple video streams. Our technology helps to reduce the camera system investment costs while ensuring the performance accuracy.”

AI

Construction monitoring



Project description

Developing artificial intelligence technology to support the process of measurement, inspecting, monitoring and accepting underground cable works



Customer

They were leading in construction of telecom infrastructures in 10 overseas countries in Asia, Africa, and America operating with 6 main offices: Infrastructure Investment, Construction (including telecommunications infrastructure construction, B2C and B2B civil construction), IT, Integrated Solutions, Engineering Services, and Operations.



Industry

Construction industry



Completion time

One year

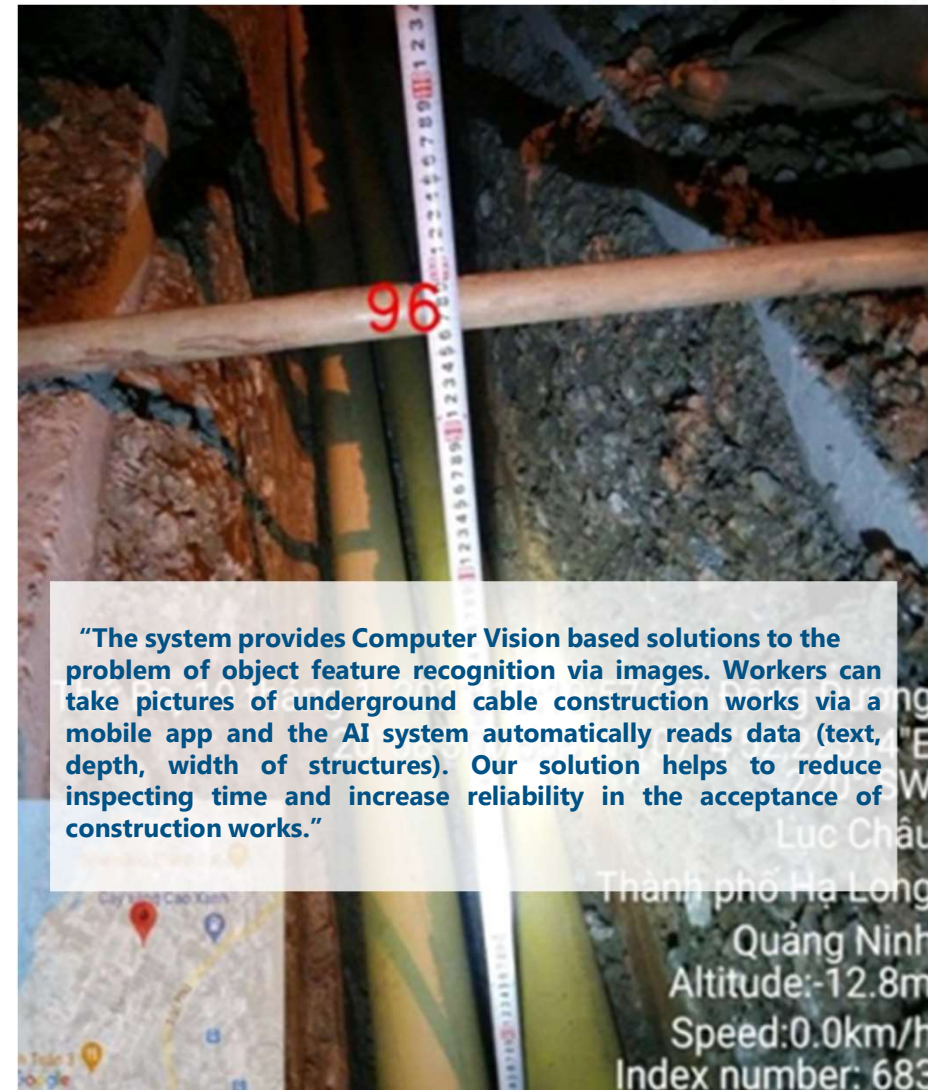


Typical results

- Automatically read data (text, depth and width) from photos of underground cable works
- Tackles challenges such as high noise, low contrast, unbalanced and sparse data.
- Recognition accuracy up to 99%
- Fully deployment tools (web app, mobile app) to support users for convenient and effective usage

Limitations

- Actual results depend on the quality of the mobile device used to provide report photos.



SCHEDULING OF PLANTING & HARVESTING AGRICULTURAL CROPS



Project description

Designing an optimal crop planting strategy for a continuous harvest.



Customer

With 14 big farms throughout Vietnam, our customer is the largest in terms of production scale and a pioneer in bringing advanced agricultural technologies of the world to Vietnam. Their products are distributed exclusively almost 3200 convenient stores throughout Vietnam and nearly 300 supermarkets in EU, Japan, and Korea.



Industry

Agricultural industry



Completion time

Two years



Typical results

- 200 soft and hard constraints
- > 150 SKUs
- 14 megafarms
- Total farming area of over 3,000 hectares, nearly 6,000 tons
- Planning time is reduced from one month to 2 hours

Limitations

- The quality of our solution has not been evaluated comprehensively because there is no competitive solution

AI



“The system provides optimization model-based solutions to the problem of planting schedules. Our tool provides a scheduling model for a set of planting orders that need to be assigned to a set of lands and provides consistent weekly harvest quantity. Our model guarantees nearly 200 soft and hard constraints. Our results have been applied to over 1500 SKUs grown across all of their 14 megafarms.”



SCHOOL BUS ROUTING



Project description

Design the optimal route for school buses.



Customer

Our customer is a not-for-profit K-12 education system, operating under and funded by its parent company, Vingroup. With a core of quality teachers and robust educational programs, they are the largest education system in Vietnam with 49 campuses serving more than 43,000 students.



Industry

Education industry



Completion time

one year



Typical results

- > 40 soft and hard constraints
- Multi-objectives: maximize the number of students served, minimize the number of vehicles used, minimize the travel distance
- Balance the benefits for stakeholders (Schools, Vehicle Contractors, Students)
- Routing time is reduced from one week to 0.5 hours
- Fill rate increased by 15%, profit margin increased by 7%

Limitations

- The quality of our solution depends on the accuracy of the data provided by the third-party service (Map services)

The screenshot displays a software interface for school bus routing. At the top, it shows the date '2019 - 2020' and a 'Cấu hình' (Settings) button. Below this are several dropdown menus for 'Tại điểm' (Location), 'Times City', 'PTLC Times City', and 'Tiểu học' (Primary school). A date field indicates 'HS đi xe bus bắt đầu từ: 31/10/2019'. The main area features a map with a red route line connecting various stops. A table on the left lists stops with columns for 'Chốt' (Check) and 'Bản đồ' (Map). The table contains three rows, each with a checkmark in the 'Chốt' column and a checkbox in the 'Bản đồ' column. The map shows a city area with labels like 'TRUNG HOA', 'MÉ TRI', 'KHU ĐÔ THỊ ROYAL CITY', 'PHƯƠNG MAI', 'ĐỒNG TÂM', and 'GIÁP BÁT'. A red line traces a path through these areas, with time markers at various stops: 06:33, 06:39, 06:47, 06:50, 06:54, 07:07, 07:13, and 07:20. A legend at the bottom right indicates 'Đồ họa bản đồ ©2019 1 km'.

“The system provides optimization model-based solutions to the school bus routing problem. Our tool helps coordinators plan more than 1000 vehicles transporting more than 25,000 students on campuses throughout Vietnam. Moderators can view and evaluate the automated solution easily. They also can make some manual adjustments on a map view. Supervisors, drivers and parents receive updated information (route, cost, transport status,...) quickly and accurately through mobile apps..”

AI4KIDS platform



Project description

A Platform for Teachers & Students to Train AI & Integrate AI in daily lectures



Customer

20+ Top 500 Enterprises in Vietnam have been franchised and used our platform



Industry

Education industry



Completion time

one year

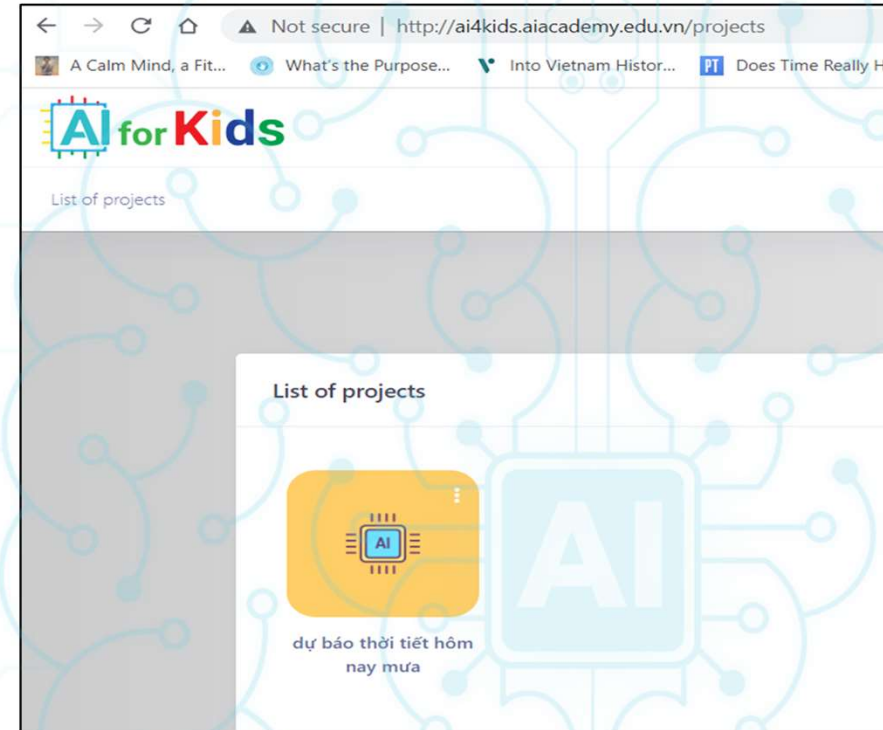


Typical results

- Easy to use: A simple product that gives TEACHERS / STUDENTS the ability and opportunity they need in order to do their work more efficiently and stay up-to-date,
- Designed with the help and input of AI/software experts, having continuous feedback from teachers
- Containing various types of data for various exercises as samples
- Powerful, friendly, stylish and functional

Limitations

- Limited numbers of users at the same time (30)
- Limited output of Scratch only (Python, Robotic)



“We provide a platform to learn AI, train AI models & apply AI solutions creatively for teachers/students in lecturing & school projects. Our platform helps upskill themselves as they understand correctly what AI is and know how to train it to work smarter. This platform is expected to change the culture of the organizations/schools once using the AI product at work...”

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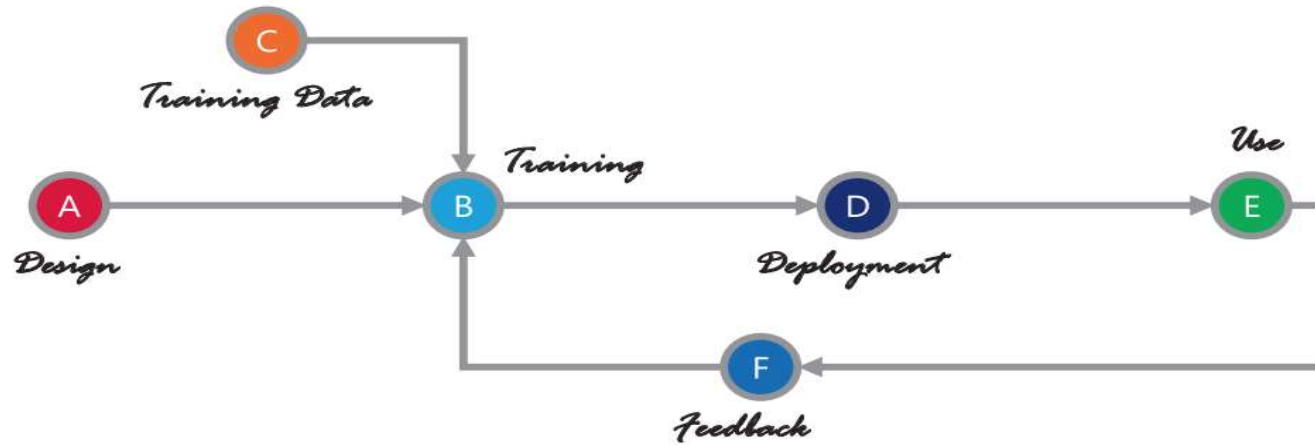
Customer-oriented

04

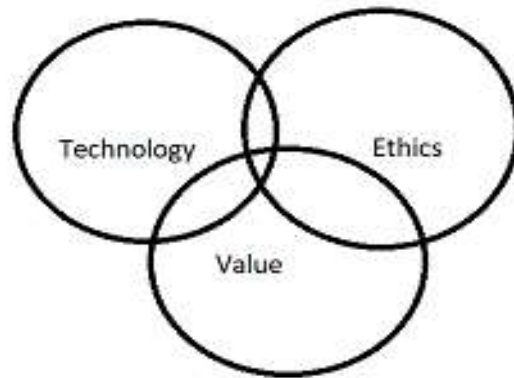
Human resource competence

Highly experienced

Full AI Development Process



Three Pillars for AI Solutions



01

Problem study and data exploration

Customer understanding

- What values does the solution of the considered problem bring to the customer?
- What are their expectations?
- Do they understand the strengths and weaknesses of AI?
- Can AI's solution solve the problem completely? or partially? Are there any alternatives?

Data exploration

- Data quality check
- Work closely with domain experts or customers to understand data semantics.
- Collect useful domain knowledge for the problem

02

R&D, PoC

POC, Feasibility study

- Discovering solution methods
- Feasibility study report including the complexity of the problem, proposed solution methods & development process.

03

Solution expectations of the customer

Aligning Customer's Expectations

- Evaluation criteria, performance measures, use cases, ...

04

AI System Analysis and Design

AI system analysis and design

- AI system analysis and design for users

05

AI system building

AI system building

- Data pre-processing, Data Enrichment
- Building and training AI models
- Building decision-making models
- Developing integrated software systems ...

06

Test, evaluation

Test, evaluation

- Test and evaluate the quality of AI models.
- Audit the entire AI product-making process to evaluate Ethics (risk, bias, security, ...).
- Integration testing.
- ...

07

Deployment and testing in the production environment

Deployment of AI product/solution

- Build decision making process.
- Collect results and metrics.
- Collect feedbacks from users.
- recalculate the benefits of AI products to customers
- System audit.
- ...

08

Support, Maintenance

Support, Maintenance

- Support, Maintenance (concept drift handle, data growth, unknown cases, ...).
- Fix bugs and AI software system warranty.
- Training, customer supports

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Human resources



NOTABLE LECTURERS/EXPERTS



**Associate Prof. PhD.
Hoai Nguyen Xuan**

Associate Prof. PhD. Hoai Nguyen Xuan received his Bachelor of Computer Science Degree from Hanoi National University, in 1997, and Master of Computer Science Degree from New South Wales University, Australia, in 2005.

In 1997, he was a lecturer in the Faculty of Information Technology, Military Academy Vietnam, in 2005 he became a main lecturer in charge of research and training in the field of Artificial Intelligence (AI) and computer programming.

From 2007-2009, he was a visiting Professor in the Faculty of Computer Science and Technology, Seoul National University (Korea), in charge of undergraduate and postgraduate training on Artificial Intelligence, Computer Intelligence and Computer Programming. From 2010-2017, he became the head of Information Technology Research and Development at Hanoi University, Associate Professor of Computer Science (2011). Since 2018, Associate Prof. Hoài has been the co-founder and director of AI Academy Vietnam.

Mr. Hoai has 20+ years of experience in research, teaching, evaluation and consulting in the field of Computer Science and Artificial Intelligence. His fields of research, teaching and consulting include Computer Intelligence, Machine Learning, Evolutionary Programming, AI Applications in Cyber Security, Operations Research, Natural Language Processing, Big Data Analytics, and Ecosystem Modelling. He has published about 100 scientific publications of the above-mentioned disciplines with almost 1700 citations listed by Google Scholar). At present, he is a member of the editorial board of the prestigious genetic programming journal - Genetic Programming and Evolvable Machines, published by Springer-Verlag. He is often invited to be a member of the expert committee of international conferences on Artificial Intelligence, Computing Intelligence, and invited to be a science denier for top-ranking journals in these fields such as IEEE Transactions on Evolutionary Computation, IEEE Transactions on Neural Networks and Learning Systems, ACM-SIG EVO GECCO, IEEE CEC, ... In Vietnam, Mr.Hoai was a member of the Information and Computer Science Committee of National Foundation for Science and Technology Development NAFOSTED in the terms 2011-2014;2014-2107. Associate Prof. Hoai Nguyen Xuan was an expert consultant on AI for Ministry of Science and Technology (MOST)(working for an AI task force to build up AI strategies for Vietnam), Vietnam Software Association (VINASA), Vietnam-Korea Institute of Science and Technology (VKIST). He and his partners are the creators of the (Vietnamese News Analytics System, currently deployed in the Vietnamese Military.



**Assoc. Dr.
Thuy Thi Nguyen**

Assoc. Dr. Thuy Thi Nguyen received her Bachelor's Degree of Informatics and Mathematics from Hanoi University of Science and Technology in 1994, Master's Degree of Information Technology in 2002, Doctoral Degree of Computer Science from Graz University of Technology, Austria in 2009. She has been a lecturer of the Computer Science subject, Faculty of Information Technology at Vietnam University of Agriculture since 1998, head of the subject since 2011, Chairman of the Information Technology Faculty Committee since 2016. She was the specially assigned Associate Professor during her time working at the Osaka University's Institute of Scientific and Industrial Research, Japan in 2016. Since 2018, Dr. Thuy has been the co-founder and Deputy Director of AI Academy Vietnam. Her areas of research include AI, Computer Vision, Image Processing, Machine Learning, and Sample Recognition. Dr. Thuy frequently participates in the training of AI, Computer Vision, and Image Processing for undergraduate and postgraduate students, advanced training for software engineers, project managers, and technology specialists of various companies, including major technology firms such as Viettel (Vietnam), Orchestra (France),... Dr. Thuy has hosted and attended a variety of national and international projects of research and applications on Image Processing, Machine Learning and Object Recognition. She has published many works in various international journals and scientific conferences and patented 3 inventions for industrial applications for smart cameras. She is a member of the Board of content and Board of Editing of many national and international scientific publications, an evaluator of many scientific topics and projects, such as those of the National Foundation for Science and Technology Development (NAFOSTED), project Smart Traffic for Hanoi, project Youth and Smart Agriculture Solution of America Embassy.



**Assoc. Dr.
Long Van Tran**

Assoc. Dr. Long Van Tran received his PhD's Degree of Computer Science from Jacobs University in 2010. At present, Assoc. Dr. Long is a lecturer at University of Transportation and Communication, Vietnam. He won the first prize in the IEEE Visualization Design Contest in 2008, hosted by IEEE Computer Society. His areas of research include Data Visualization, Information Visualization, Data Analytics, Computational Intelligence, Machine Learning and Computer Graphics.



Dr. Dang Thai Viet



Dr. Cao Truong Tran

Dr. Dang Thai Viet - Doctor of Energy Engineering, Electrical Engineering of Central National University, Taiwan. Master of Electrical Engineering in Electrical Engineering from Hanoi University of Science and Technology (HUST) - Hanoi, Vietnam. Trainer, School of Engineering (SME), Hanoi University of Technology (HUST). Deputy Head of Department of Mechatronics, SME, HUST and Director of Mechatronics Design and Control Laboratory.

Dr. Dang Thai Viet received a Master's Degree in Electrical Engineering with a degree in Electrical Engineering from Hanoi University of Science and Technology (HUST) -Hanoi, Vietnam in 2007 and a Doctorate in Energy Engineering, Electrical Engineering of National Central University, Taiwan in 2012. Dr. Viet is a lecturer of School of Engineering (SME), Hanoi University of Technology (HUST), Deputy Head of Mechatronics Department, SME, HUST and Director of Laboratory Design and Control of Mechatronics Systems (DCMS Laboratories). Dr.Viet is an expert of STEM / IT experts in developing STEM / IT education programs for all levels: middle school level, high school and university. In particular, leading the course AI (Artificial Intelligence) combined with STEM / IoT systems for Vietnamese businesses, research and improving STEM / IT educational performance and AI for their skills, people, business management and information prediction.

Dr. Cao Truong Tran received the PhD degree in computer science from Victoria University of Wellington, New Zealand. He also did postdocs at Victoria University of Wellington. He is researching in the field of machine learning and evolutionary computation, specializing in evolutionary machine learning for data mining with missing data.

He serves as a reviewer of international journals, including IEEE Transactions on Evolutionary Computation, IEEE Transactions on Cybernetics, Pattern Recognition, Knowledge-Based Systems, Applied Soft Computing and Engineering Application of Artificial Intelligence. He is also a PC member of international conferences, including IEEE Congress on Evolutionary Computation, IEEE Symposium Series on Computational Intelligence, the Australasian Joint Conference on Artificial Intelligence and the AAAI Conference on Artificial Intelligence.



Dr. Phan Viet Anh

Dr. Phan Viet Anh received the B.Sc. degree in information technology, and the MSc degree in computer science from Le Quy Don Technical University, Vietnam, in 2008 and 2013, respectively, PhD degree in computer science from Japan Advanced Institute of Science and Technology (JAIST) in 2018 with outstanding student award.

He has participated as a key member in various research and industrial projects related to database management systems, applications of machine learning to image and language processing. Currently, he is a lecturer at Le Quy Don Technical University (LQDTU). His research interests include machine learning, software engineering, evolutionary computation, and deep learning. He published refereed academic papers/articles on high-quality conferences (ICTAI, IDEAL, IES, ...)/ journals (Applied Intelligence, Data & Knowledge Engineering, Neural Networks). He has been a reviewer for the KSE conference and the journal of Data & Knowledge Engineering.



Dr. Van Do Nguyen

Dr. Cao Truong Tran received the PhD degree in computer science from Victoria University of Wellington, New Zealand. He also did postdocs at Victoria University of Wellington. He is researching in the field of machine learning and evolutionary computation, specializing in evolutionary machine learning for data mining with missing data.

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Dr. Sang Viet Dinh

Dr. Sang Viet Dinh received his Bachelor's Degree of Computing Engineering in 2009 and Master's Degree of Computer Science in 2011 from Tula State University, Russia. He received PhD's Degree of Computer Science at Computer Vision Dorodnitsyn Center of Computing of Russian Academy of Sciences in 2013. Currently, he is a lecturer at SoICT, Hanoi University of Science and Technology. His areas of teaching include machine learning, big data processing, image processing, computer vision, scientific computing, applied algorithms and computer science fundamentals. His areas of research are machine learning and computer vision.



Dr. Phan Hai Hong

Dr. Phan Hai Hong received her PhD in Computer Science from CY Cergy University in Paris, France in 2019. She has more than 10 years of experience in research, teaching, consulting and implementing information technology projects. Her studies focus on computer vision, image processing, face recognition, action recognition, and machine learning. She is a reviewer for several international journals. She has published scientific articles in a number of quality journals and conferences such as IEEE Applied Sciences, Multimed Tools Appl, IET Computer Vision, International Conference on Pattern Recognition (ICPR)...



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