

Tuyen P. Le | Resume

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*"Humans should be worried about the threat posed by
artificial intelligence." **Bill Gates***

Education

Kyung Hee University [Link] <i>Master and Ph.D., 4.14/4.3</i> Research Topics: Deep Reinforcement Learning, Machine Learning, Big Data, Robotics	South Korea 2014/03–2019/02
HoChiMinh City University of Technology [Link] <i>Bachelor, 8.46/10.0</i> Honor program	Ho Chi Minh City 2008–2013
Luong Van Chanh Gifted High School <i>Diploma, 9+/10</i> Subjects taken: Mathematics, Physics, Chemistry, English ...	Phu Yen province 2005–2008

Research Interest

My research interest generally focuses on employing various machine learning techniques such as gradient descent, kernel based methods, sampling methods and probability theory to design, analyze and improve the cutting-edge applications in reinforcement learning such as: deep reinforcement learning, computer games, robotics controls, autonomous vehicle controls, and network systems controls.

Research keywords: reinforcement learning, deep learning, hierarchical reinforcement learning (SMDP), robotics, planing under partial observability (POMDPs)

Ph.D. Dissertation

Title: Deep Hierarchical Reinforcement Learning Algorithms in Partially Observable Markov Decision Processes (**Advisor:** Ngo Anh Vien, **Supervisor:** TaeChoong Chung)

Abstract: In recent years, reinforcement learning has achieved many remarkable successes due to the growing adoption of deep learning techniques and the rapid growth in computing power. Nevertheless, it is well-known that flat reinforcement learning algorithms are often not able to learn well and data-efficient in tasks having hierarchical structures, e.g. consisting of multiple subtasks. Hierarchical reinforcement learning is a principled approach that is able to tackle these challenging tasks. On the other hand, many real-world tasks usually have only partial observability in which state measurements are often imperfect and partially observable. The problems of RL in such settings can be formulated as a partially observable Markov decision process (POMDP). In this paper, we

study hierarchical RL in POMDP in which the tasks have only partial observability and possess hierarchical properties. We propose a hierarchical deep reinforcement learning approach for learning in hierarchical POMDP. The deep hierarchical RL algorithm is proposed to apply to both MDP and POMDP learning. We evaluate the proposed algorithm on various challenging hierarchical POMDP.

Experience

Professional.....

Software Engineer at KMS Technology Vietnam [Link]

Ho Chi Minh City

Position:, Software engineer at R&D department

2013–2014

Role: Developed various mobile apps (iOS and Android) such as Football statware [Link], Basketball Statware [Link] and pixNotes (a tool for internal use) [Link]. Implemented any ideas from R&D Manager.

Miscellaneous.....

Internship at Recobell (Yello Mobile) [Link]

Seoul City

Position:, Intern at IT department

2015–2016

Role: Maintained various e-commerce mobile apps (iOS and Android) such as 금찌 [Link] and w컨셉 [Link]. Sometimes, I did the jobs related to web service on AWS.

Internship at Polliwog Corp. [Link]

Seongnam City

Position:, Intern at IT department

2014–2015

Description: Using various techniques in computer graphic, data structures and algorithms to develop algorithms (C++) for PolliEx, which is a software for designing Printed Circuit Board. The achievements are reported at [here] and [here].

Research Projects

2017-06-01 ~ 2020-05-31.....

NRF-2017R1D1A1B04036354

한국과학재단

2017–2020

Description: 자기균형 문제를 위한 Deep 강화학습 알고리즘 개발 및 응용 (Developing Deep Reinforcement Learning Algorithm for Self Balancing Problem and Its Applications)

2014-11-01 ~ 2017-04-30.....

NRF-2014R1A1A2057735

한국과학재단

2014–2017

Description: 다양한 이동로봇의 지능적 제어 알고리즘 개발 및 응용 (Development and Application of Intelligent Control Algorithms for Various Mobile Robots)

2010-05-01 ~ 2015-04-30.....

NRF-2010-0012609

한국과학재단

2010–2015

Description: 동적인 환경에서 이동로봇의 충돌회피를 위한 강화학습법 개발 및 응용 (Development and application of Reinforcement learning for Robot Obstacle Avoidance in Dynamic Environment)

Languages

Korean: Intermediate level (TOPIK I level 2)

Read, Write, Speak (simple form)

English: Fluent

Second language

Vietnamese: Native

Mother language

Computer skills

Programming Languages: Python, Java, C++, Objective-C, Swift, Matlab, RDF, HTML, XML, CSS, Javascript, Git

Tools: Pycharm, Visual Studio, Matlab, Eclipse, XCode, Inkscape, Photoshop, Lightroom, Premiere, Draw.io.

Libraries: Cocoa, OpenCV, Tensorflow, Matplotlib, ROS, Gym AI, Hadoop, Spark

Platforms: Window, Mac, Ubuntu, AWS, iOS, Android

Courses I did

Machine Learning and Robotics: Big Data Analysis, Mobile Robotics, Data Mining, Semantic Web, Machine Learning, Artificial Intelligence

Related CS: Query Processing, Information Visualization, Advanced Computer Graphics, Future Internet, Computer Vision, Real-time Systems, Advanced Topic in Information Security, Technical Writing

Mathematics: Graph Theory, Queuing Theory, Advanced Probability and Statistics, Engineering Optimization, Discrete Mathematics

Undergraduate: Computer Architecture, OOP, Data Structure and Algorithms, Database Systems, Operating Systems, Computer Networks, Computer Graphics, Algorithmic Analysis, Distributed Systems, Cryptography

Honors

- o Talented engineer program (a.k.a. honor program) in undergraduate.
- o University Scholarship (both undergraduate and graduate).

References

Dr. TaeChoong Chung [Link]

Professor at Artificial Intelligence Lab, Kyung Hee University

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Dr. Ngo Anh Vien [Link]

Assistant Professor at Queen's University Belfast

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Email: v.ngo@qub.ac.uk

Publications

International Journals.....

- [1] T. P. Le, N. A. Vien, and T. Chung. A deep hierarchical reinforcement learning algorithm in partially observable markov decision processes. *IEEE Access (SCIE, IF:3.557)*, 6:49089–49102, 7 2018.

- [2] Tuyen P. Le, Hoang Huu Viet, Sang Hyeok An, Seung Gwan Lee, Dong-Han Kim, and Tae Choong Chung. Univector field method-based multi-agent navigation for pursuit problem in obstacle environments. *Journal of Central South University (SCIE, IF:0.761)*, 24(4):1002–1012, Apr 2017.
- [3] Tuyen Pham Le, Vien Anh Ngo, P. Marlith Jaramillo, and TaeChoong Chung. Importance sampling policy gradient algorithms in reproducing kernel hilbert space. *Artificial Intelligence Review (SCI, IF:3.814)*, Oct 2017.
- [4] Hoang Huu Viet, Le Hong Trang, SeungGwan Lee, Le Pham Tuyen, and TaeChoong Chung. A shortlist-based bidirectional local search for the stable marriage problem. *Applied Intelligence (SCI, IF:1.983)*, 2018 (Major Revision).

Domestic Journals.....

- [5] 최 승 윤, Tuyen P. Le, and 정 태 충. Deep deterministic policy gradient 알고리즘을 응용한 자전거의 자율 주행 제어. *Convergence Security Journal*, 18(3), 2018.

International Conferences.....

- [6] Viet-Hung Dang, Ngo Anh Vien, Tuyen P. Le, and Taechoong Chung. A functional optimization method for continuous domains. In Yuanfang Chen and Trung Q. Duong, editors, *Industrial Networks and Intelligent Systems*, pages 254–265, Cham, 2018. Springer International Publishing.
- [7] M. A. Layek, N. Q. Thai, M. A. Hossain, N. T. Thu, Tuyen P. Le, A. Talukder, T. Chung, and E. N. Huh. Performance analysis of h.264, h.265, vp9 and av1 video encoders. In *2017 19th Asia-Pacific Network Operations and Management Symposium (APNOMS2017)*, pages 322–325, Sept 2017.
- [8] Tuyen P. Le and T. Chung. Controlling bicycle using deep deterministic policy gradient algorithm. In *2017 14th International Conference on Ubiquitous Robots and Ambient Intelligence (URAI2017)*, pages 413–417, June 2017.
- [9] Tuyen P. Le, A. Layek, N. A. Vien, and T. Chung. Deep reinforcement learning algorithms for steering an underactuated ship. In *2017 IEEE International Conference on Multisensor Fusion and Integration for Intelligent Systems (MFI2017)*, pages 602–607, Nov 2017.
- [10] Tuyen P. Le, Nguyen Dang Quang, SeungYoon Choi, and TaeChoong Chung. Learning a self-driving bicycle using deep deterministic policy gradient. In *18th International Conference on Control, Automation and Systems (ICCAS2018)*, Oct 2018.

Domestic Conferences.....

- [11] Tae Choong Chung and Le Pham Tuyen. Pleasure of Learning. *ICCC International Digital Design Invitation Exhibition*, :131–131, 2017.
- [12] TaeChoong Chung and Le Pham Tuyen. RLVisualizer: An application for Visualizing Trajectories of Reinforcement Learning Problem. volume , pages 13–14. The Korea Contents Society, 2017.
- [13] CholJin Jong, Seung yoon Choi, JinSeok Kim, Md. Abu Layek, Tuyen P. Le, Marlith Jaramillo, and TaeChoong Chung. Study of Sound Location Tracking Mobile Robot Using Lego Mindstorms. volume , pages 1028–1029. KOREA INFORMATION SCIENCE SOCIETY, 2016.
- [14] JinSeok Kim, Seung yoon Choi, CholJin Jong, Md. Abu Layek, Tuyen P. Le, Marlith Jaramillo, and TaeChoong Chung. Selected wireless mesh network model and architecture for a communication

interruption in the fixed wireless environment. volume , pages 1265–1267. KOREA INFORMATION SCIENCE SOCIETY, 2016.

- [15] Md Abu Layek, Ngo Quang Thai, Md Alamgir Hossain, Ngo Thien Thu, Tuyen P. Le, Ashis Talukder, TaeChoong Chung, and Eui-Nam Huh. Analysis of the Effects of Timing Presets on the Performance of H.264/AVC and H.265/HEVC Video Encoders. volume , pages 442–443. Korea Institute Of Communication Sciences, 2017.
- [16] Md Abu Layek, Ngo Quang Thai, Md Alamgir Hossain, Ngo Thien Thu, Tuyen P. Le, Ashis Talukder, TaeChoong Chung, and Eui-Nam Huh. Performance Analysis of AV1 for Video Coding in Very Low Bit Rates. volume , pages 118–120. KOREA INFORMATION SCIENCE SOCIETY, 2017.
- [17] Md. Abu Layek, Seung yoon Choi, Tuyen P. Le, Marlith Jaramillo, JinSeok Kim, Jeong cheol jin, Eui-Nam Huh, and TaeChoong Chung. Compression Efficiency Of Text Images In Hangul And Other Languages. volume , pages 777–779. KOREA INFORMATION SCIENCE SOCIETY, 2016.
- [18] Tuyen P. Le, Abu Layek, Seung yoon Choi, and TaeChoong Chung. Gathering Objects in Four-rooms Domain under Partially Observability. volume , pages 865–867. KOREA INFORMATION SCIENCE SOCIETY, 2017.
- [19] Tuyen P. Le, Md. Abu Layek, Marlith Jaramillo, CholJin Jong, Seung yoon Choi, JinSeok Kim, and TaeChoong Chung. A Non-parametric policy based Algorithm in Reproducing Kernel Hilbert Space. volume , pages 892–893. KOREA INFORMATION SCIENCE SOCIETY, 2016.
- [20] Tuyen P. Le, Md. Abu Layek, CholJin Jong, Seung yoon Choi, JinSeok Kim, and TaeChoong Chung. Reinforcement Learning of Vehicle Agent and Art work Trial using the Learning Trajectories. volume , pages 719–721. KOREA INFORMATION SCIENCE SOCIETY, 2017.
- [21] Minh N. H. Nguyen, Tuyen P. Le, Nguyen H. Tran, and Choong Seon Hong. Deep Reinforcement Learning based Smart Building Energy Management. volume , pages 871–873. KOREA INFORMATION SCIENCE SOCIETY, 2017.
- [22] Seung yoon Choi, Md. Abu Layek, Tuyen P. Le, Cheoljin Jeong, Jinseok Kim, Marlith Jaramillo, and TaeChoong Chung. A Study of Sequential Workspace Management Approach for Autonomous Mobile Robot in Path Planning Problem. volume , pages 1036–1038. KOREA INFORMATION SCIENCE SOCIETY, 2016.

Tuyen P. Le | Cover Letter

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HR Staffs

October 25th, 2018

Kakao Brain, Seongnam-si, South Korea.

Dear Sir or Madam,

It was with much interest that I read the paper "*Bayesian Model-Agnostic Meta-Learning*" which was accepted to publish on NIPS2018. I was amazed that one of the authors of this paper is a research scientist from Kakao Brain, Dr. Sungwoong Kim, who has made cutting-edge ideas in the meta-learning area. It makes me believe that Kakao Brain is the best place to catch up state-of-the-art ideas on Machine Learning as well as Artificial Intelligence. Working with brilliant minds from Kakao Brain is my wish. It motivates me to submit my resume to you for your consideration.

Currently, I have already passed the second round of dissertation defense at the Department of Computer Science and Engineering, Kyung Hee University and I am expected to graduate this semester (December). At Artificial Intelligence lab, I work in the area of Machine Learning with Prof. Ngo Anh Vien and Prof. TaeChoong Chung. Particularly, I am interested in Deep Reinforcement Learning applied to games, robotics and autonomous vehicles. I have used some machine learning techniques such as gradient descent, kernel-based methods, sampling methods, and probability to design, analyze and improve the newest algorithms in reinforcement learning. I have several papers which are published on SCI(E) journals and IEEE Proceedings. Besides the main researches in reinforcement learning, I am also familiar with other techniques used in big data analysis and cloud computing. In addition, I have around two years of experience to work at some companies in Vietnam and South Korea.

Finally, I have attached my resume in this letter. Through it, I hope you will learn more about my background, education, experience, and publications.

If I can provide you with any further information, please let me know. I look forward to hearing from you. Thank you for your consideration.

Thanks and Best Regards,

Tuyen P. Le

Tuyen P. Le | Research Statement

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Statement of Research Interests

Monday, 15th November, 2018

This letter describes my background and personality, and expresses my interest for the position of research scientist at Kakao Brain:

Who am I?!

I have been doing my doctoral studies for five years in the Artificial Intelligence Lab having supervisors TaeChoong Chung and Ngo Anh Vien. This was a fruitful period during which I worked in several topics of machine learning, reinforcement learning and robotics. I involve in several NRF projects (National Research Foundation projects) whose outcomes are three SCI(E) journals and several IEEE proceedings. In addition, I intern at some companies as a part of the projects in which I can learn about company culture in Korea. In personality, I am upfront person. I like to learn new things as well as challenged myself by hard problems.

What can I offer?!

- ¹ During my PhD time, I involve in research projects which help me improve research skills such as searching, writing, presentation, cooperating. I have ability to work independently on a project as well as cooperate with other persons to generate great values for Kakao Brain.
- ² I have the knowledge in areas such as reinforcement learning, deep learning, and robotics and have ability to catch up state-of-the-art ideas on those areas. In addition, I am also familiar with other techniques used in big data analysis and cloud computing which can adapt with various projects in Kakao Brain.
- ³ I have a network of good mentors who can support me to build great ideas
- ⁴ I have working experience at several companies in Vietnam and South Korea. So, I believe that I can easily adapt with the culture at Kakao Brain
- ⁵ I have some on-going projects which have the potential to obtain remarkable success. I believe that Kakao Brain with brilliant minds is the best place to implement unfinished ideas.

Why do I apply to Kakao Brain?!

- ¹ I want to bring all my knowledge to contribute to real products in Kakao ecosystems.
- ² I want to challenge myself by hard issues in Kakao Brain. Working with talented people in Kakao Brain somehow makes me feel pressured. However, it gives me more motivation to pursuit the career path at Kakao Brain.
- ³ Kakao Brain is a place gathering talented people, thus, I would like to work with them in order to learn from them and catch up newest ideas in AI.

Suwon-si, South Korea
Tuyen P. Le