

JAEYOUNG LEE | CURRICULUM VITAE

GENERAL INFORMATION

ADDRESS: Christabel Pankhurst Building, Dover St, Manchester, United Kingdom M13 9PS.
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 E-MAIL: jaeyoung.lee@manchester.ac.uk
 WEBSITES: Homepage (jaeyounglee.netlify.app) | [LinkedIn](#) | [GoogleScholar](#) | [ResearchGate](#)
 PUBLISHED: 16 journal, 27 conference and 3 workshop articles.

AFFILIATIONS

JAN. 2024–PRESENT **Research Fellow** at [Centre for AI Fundamentals](#) co-led by Prof. [Samuel Kaski](#),
 Computer Science, University of Manchester, UK.
 Conducting research on reinforcement learning, AI-assistant and user-modeling
 Collaborating with postdoctoral researchers and PhD candidates

FEB. 2021–MAR. 2022 **Research Associate**
 JAN. 2018–JAN. 2021 **Postdoctoral Fellow** at [WISE Lab](#). led by Prof. [Krzysztof Czarnecki](#),
 (excl. JAN. 2020)
 Electrical and Computer Engineering, University of Waterloo, ON, Canada.
 Conducted research on (safe) reinforcement learning (RL) and autonomous driving
 Collaborated interdisciplinarily in RL / deep learning / formal verification / control theory
 Mentored and collaborated with graduate students in [WISE Lab](#). and [NII](#) in Japan

AUG. 2015–DEC. 2017 **Postdoctoral Fellow** at [RLAI Lab](#). led by Prof. [Richard S. Sutton](#),
 Computing Science, University of Alberta, AB, Canada.
 Conducted research on reinforcement learning and optimal control
 Studied reinforcement learning from AI-perspectives
 Mentored and collaborated with graduate students and visiting employees from industry

EDUCATION

SEP. 2007–AUG. 2015 **Ph.D.** in Electrical and Electronics Eng., [Yonsei University](#), Seoul, South Korea. GPA 4.0/4.3
Dissertation: Integral Reinforcement Learning and Adaptive Inverse Optimal Control
 for Continuous-time Dynamical Systems
 Supervisor: Prof. [Jin Bae Park](#)

MAR. 2002–AUG. 2006 **B.E.** in Information and Control Eng., [Kwangwoon University](#), Seoul, South Korea. GPA 4.0/4.5
 Minor: Electronics Engineering

CURRENT RESEARCH INTERESTS

Reinforcement Learning for AI-Assistant and User-Modeling

Inverse (constrained) reinforcement learning for user-modeling with computational rationality
 Model-based Bayesian reinforcement learning for AI-assistant
 Experimental-design-based exploration and exploitation trade-off for better modeling and decision-making

 OTHER RESEARCH INTERESTS

(Safe/Deep) Reinforcement and Imitation Learning; Their Applications to Autonomous Driving

(Deep) reinforcement learning under safety requirements and/or hierarchical decision-making architecture
 Distillation, imitation and explanation of a DQN policy
 Advanced prioritization techniques (such as [PER](#)) for deep reinforcement learning
 Applications to autonomous driving through simulations, quantitative evaluations and transfer RL

Reinforcement Learning, Dynamic Programming and Adaptive Optimal Control

Dynamic programming and reinforcement learning in stochastic/deterministic environment
 (Adaptive) optimal control based on reinforcement learning and dynamic programming principles
 Theory (e.g., regarding stability and optimality) on adaptive and/or optimal control of dynamic systems

Multi-agent Systems and Control for Autonomous Driving

Game-theoretic, receding horizon maneuver planning for behavioural decision-making in autonomous driving
 Multi-agent dynamic systems with distributed consensus, and its applications to vehicles' formation control

 SELECTED PUBLICATIONS (* contributed equally)

Constrained Reinforcement Learning for Safety-Critical Systems
[Uniformly Constrained Reinforcement Learning](#)

(2024) [Lee, J.*](#), [Sedwards, S.*](#) & [Czarnecki, K.](#) *JAAMAS*, 38(1). Part of a collection [MODeM](#).

[Recursive Constraints to Prevent Instability in Constrained Reinforcement Learning](#) (cited: 1)

[[video](#) | [slides](#)]

(2021) [Lee, J.*](#), [Sedwards, S.*](#) & [Czarnecki, K.](#) In: *Proc. 1st MODeM 2021*, [Hayes](#), [Mannion](#), [Vamplew](#) (eds.). Virtual.

Distillation and Imitation of Deep Q-Network by Decision Tree, for Formal Verification
[Non-Divergent Imitation for Verification of Complex Learned Controllers](#) (cited: 1)

[[video](#) | [slides](#)]

(2021) [Abdelzad, V.*](#), [Lee, J.*](#), [Sedwards, S.*](#), [Soltani, S.*](#) & [Czarnecki, K.](#) In: *2021 IJCNN*. Virtual.

[Improved Policy Extraction via Online Q-Value Distillation](#) (cited: 2)

(2020) [Jhunjhunwala, A.](#), [Lee, J.](#), [Sedwards, S.](#), [Abdelzad, V.](#) & [Czarnecki, K.](#) In: *2020 IEEE WCCI (IJCNN)*. Virtual.

Deep Reinforcement Learning (for Autonomous Driving)
[WISEMOVE: a Framework to Investigate Safe Deep Reinforcement Learning for Autonomous Driving](#) [[arXiv](#) | [slides](#) | [git](#)]

(2019) [Lee, J.*](#), [Balakrishnan, A.*](#), [Gaurav, A.*](#), [Czarnecki, K.](#) & [Sedwards, S.*](#) In: [Parker D.](#), [Wolf V.](#) (eds) *QEST 2019*. Lecture Notes in Computer Science, vol. 11785. Glasgow, U.K. (cited: 20, including preprints).

[Transfer Reinforcement Learning for Autonomous Driving: From WISEMOVE to WISESIM](#) (cited: 1)

[[git](#)]

(2021) [Balakrishnan, A.](#), [Lee, J.](#), [Gaurav, A.](#), [Czarnecki, K.](#) & [Sedwards, S.](#) *ACM TOMAC*, 31(3), Article No. 15.

[Predictive PER: Balancing Priority and Diversity Towards Stable Deep Reinforcement Learning](#) [[NeurIPS](#) | [arXiv](#) | [video](#)]

(2021) [Lee, S.](#), [Lee, J.](#) & [Hasuo, I.](#) In: *2021 IJCNN*. Virtual. (cited: 1).

(2020) [Lee, S.](#), [Lee, J.](#) & [Hasuo, I.](#) In: *Deep Reinforcement Learning Workshop in 2020 NeurIPS*. Virtual. (cited: 3).

Reinforcement Learning, Dynamic Programming and Adaptive Optimal Control
[Policy Iterations for Reinforcement Learning Problems in Continuous Time and Space: Fundamental Theory and Methods](#)

(2021) [Lee, J.](#) & [Sutton, R.S.](#) *Automatica*, 126, 109421. (cited: 38, IF: 5.944).

[[arXiv](#) | [git](#)]

[Policy Iteration for Discounted Reinforcement Learning Problems in Continuous Time and Space](#) (cited: 1) [[poster](#) | [slides](#)]

(2017) [Lee, J.Y.](#) & [Sutton, R.S.](#) In: *RLDM Extended Abstracts*, 148–152. Ann Arbor, MI, USA.

- [Integral Q-Learning and Explorized Policy Iteration for Adaptive Optimal Control of Continuous-Time Linear Systems](#)
(2012) **Lee, J.Y.**, Park, J.B. & Choi, Y.H. *Automatica*, 48(11), 2850–2859. (cited: 177, IF: 5.944). [preprint | git]
- [Integral Reinforcement Learning for a Class of Nonlinear Systems with Invariant Explorations](#) [preprint | git]
(2014) **Lee, J.Y.**, Park, J.B. & Choi, Y.H. *IEEE Trans. NNLS*, 26(5), 916–932. (cited: 109, IF: 14.255).
- [On Integral Generalized Policy Iteration for Continuous-Time Linear Quadratic Regulations](#) [preprint]
(2014) **Lee, J.Y.**, Park, J.B. & Choi, Y.H. *Automatica*, 50(2), 475–489. (cited: 35, IF: 5.944).
- [Stability and Monotone Convergence of Generalised Policy Iteration for Discrete-Time Linear Quadratic Regulations](#)
(2016) Chun, T.Y., **Lee, J.Y.**, Park, J.B. & Choi, Y.H. *Int J Control*, 89(3), 437–450. (cited: 20).
- [Adaptive Dynamic Programming for Discrete-Time LQR Based on Multirate Generalised Policy Iteration](#) (cited: 7)
(2018) Chun, T.Y., **Lee, J.Y.**, Park, J.B. & Choi, Y.H. *Int J Control*, 91(6), 1223–1240.

Multi-agent Inverse Optimal Consensus and Its Applications to Vehicles' Formation Control

- [Inverse Optimal Design of the Distributed Consensus Protocol for Formation Control of Multiple Mobile Robots](#)
(2014) **Lee, J.Y.**, Choi, Y.H. & Park, J.B. In: *Proc. 53rd IEEE CDC*, 2222–2227. LA, CA, USA. (cited: 4) [preprint]
- [On Stability and Inverse Optimality for a Class of Multi-Agent Linear Consensus Protocols](#)
(2018) Lee, G.U., **Lee, J.Y.**, Park, J.B. & Choi, Y.H. *IJCAS*, 16(3), 1194–1206. (cited: 6).
- [LQ Inv. Optimal Consensus Protocol for Continuous-Time Multi-Agent Systems and Its Application to Formation Control](#)
(2014) **Lee, J.Y.** & Choi, Y.H. *Journal of ICROS*, 20(5), 526–532. (cited: 4; in Korean) [preprint]

PREV. RESEARCH EXPERIENCES

JAN. 2018–MAR. 2022 **Research Associate** (FEB. 2021–MAR. 2022) & **Postdoctoral Fellow** (JAN. 2018–JAN. 2021)
(excl. JAN. 2020) at [WISE Lab.](#), Electrical and Computer Engineering, University of Waterloo, ON, Canada.

Researched, analyzed and proposed:

- Constrained reinforcement learning for safety-critical systems: theory and methods
- Advanced prioritization methods for deep Q-learning (e.g., studied [PER](#) & proposed Predictive [PER](#))
- Algorithms for distillation/imitation of deep Q-network by decision tree, for formal verification
- Game-theoretic finite horizon maneuver planner for decision-making in lane change scenarios (on-going)

Planned and developed [WISEMOVE](#): a software tool to investigate safe (deep) RL for autonomous driving

- Each maneuver is defined as a high-level action (i.e., an option) described by linear temporal logic
- Low-level controllers and high-level decision-makers were trained using appropriate deep RL methods

Others:

- Some experiences on transfer reinforcement learning and explainable AI/RL
- Designed the longitudinal speed profile generator in autonomous vehicle platform
- Surveyed game-theoretic multi-agent RL approaches

AUG. 2015–DEC. 2017 **Postdoctoral Fellow** at [RLAI Lab.](#), Computing Science, University of Alberta, AB, Canada.

Researched, analyzed and proposed in continuous domain (e.g., continuous time and space):

- Dynamic programming (e.g., integral and differential policy iterations)
- TD-type reinforcement learning methods (e.g., TD(λ) and actor-critic)

Extended the proposed methods to stochastic frameworks

Studied reinforcement learning in AI-perspectives and stochastic differential equations

Participated in the Alberta-Mitsubishi joint study as the project-leading researcher

SEP. 2007–AUG. 2015 **Research Assistant** at Control Engineering Lab., Electrical and Electronics Engineering, Yonsei University, Seoul, South Korea.

Researched, analyzed and proposed:

Dynamic programming and reinforcement learning for adaptive optimal control of dynamic systems
Adaptive inverse optimal cooperative formation control for multi-agent unmanned vehicles

Organized and participated in the projects in control, autonomous driving and power systems/electronics
Project-leading · Main study · Simulations · Related survey · Analysis · Experiments

PREV. MENTORING, TEACHING AND COLLABORATING EXPERIENCES

JAN. 2018–MAR. 2022 **Research Associate** (FEB. 2021–PRESENT) & **Postdoctoral Fellow** (JAN. 2018–JAN. 2021) (excl. JAN. 2020) at [WISE Lab.](#), Electrical and Computer Engineering, University of Waterloo, ON, Canada.

Collaborated:

Internationally with researchers and graduate students in [WISE Lab.](#) and [NII](#) in Japan.
Interdisciplinarily in RL / deep learning / formal verification / control theory

Mentored graduate students in [WISE Lab.](#) and [NII](#) in Japan

AUG. 2015–DEC. 2017 **Postdoctoral Fellow** at [RLAI Lab.](#), Computing Science, University of Alberta, AB, Canada.

Mentored and collaborated with graduate students in [RLAI Lab.](#) and visiting employees from industry

SEP. 2007–AUG. 2015 **Research Assistant** at Control Engineering Lab., Electrical and Electronics Engineering, Yonsei University, Seoul, South Korea.

Mentored and collaborated with graduate students in Control Engineering Lab.

MAR. 2008–DEC. 2010 **Teaching Assistant** in Electrical and Electronics Engineering
Yonsei University, Seoul, South Korea.

Assisted the professor in preparing and lecturing

Graduate courses – Robust Control (2008 spring) · Adaptive Control (2009 spring)

Made complete slides, lectured underlying theory, guided the experiments and evaluated the students in:

Undergraduate courses – Experimental Control and Power Electronics Engineering — Control Part (2008 fall; 2009 fall; 2010 fall)

PROJECTS (machine learning, control and autonomous driving fields)

JAN. 2018–MAR. 2022 **ERATO: HASUO Metamathematics for Systems Design Project**
(excl. JAN. 2020) – *the Japan Science and Technology Agency (JST)*

See [Research Experiences and Mentoring, Teaching and Collaborating Experiences](#) above (2018–2022)

SEP. 2017–DEC. 2017 **Alberta-Mitsubishi Joint Study on Robotic Cable Connection Task**
– *Mitsubishi Electric Corporation*

Surveyed related works and techniques

Studied and implemented the idea of combining demonstrations to speed up RL under sparse reward

Served as the project-leading researcher

Mentored a visiting employee of Mitsubishi Electric Corporation

MAY 2015–AUG. 2015 **Semantic-Information-Aided Map Matching and Ground Vehicle Localization**
– *D2 Innovation*

Contributed to the development of the graph-theoretic road-information DB-to-DB matching method

Planned, organized and wrote the project funding proposal

Planned and performed the preliminary research

Served as the project-leading researcher

JUNE 2013–MAY 2015 **A Study on the Development of a Model-free Adaptive Optimal Cooperative Formation Protocol for Multiple Heterogeneous Unmanned Vehicles.**
 – *National Research Foundation of Korea*

Proposed and analyzed the core adaptive optimal cooperative formation protocol
 Planned, organized and wrote the project funding proposal
 Served as the project-leading researcher

MAY 2009–APR. 2010 **Adaptive Sliding-mode Formation Control and Collision Avoidance for Multi-agent Nonholonomic Mobile Robots with Model Uncertainty and Disturbance: Intelligent Approach** – *National Research Foundation of Korea*

Simulated the neural-network-based adaptive sliding-mode formation control for performance evaluation

PROGRAMMING, SOFTWARE AND HARDWARE SKILLS

Programming Skills and Languages

Python with $\left\{ \begin{array}{l} \text{TensorFlow and Keras, for deep reinforcement learning;} \\ \text{Numba for code optimization.} \end{array} \right.$

Object-Oriented-Programming (OOP) using C++, Python and MATLAB.

MATLAB/Simulink for numerical simulations.

C/C++ for $\left\{ \begin{array}{l} \text{research-purposed high-speed simulations;} \\ \text{MATLAB code optimization;} \\ \text{micro-controller firmware programming;} \\ \text{windows applications (MFC/API).} \end{array} \right.$

Selected Git Repositories

[WiseMove](#): A Framework to Investigate Safe Deep Reinforcement Learning (Python using keras/keras-rl)

Uniformly-constrained Reinforcement Learning (C++) — currently private (available upon request)

[Policy Iteration for Reinforcement Learning in Continuous Time and Space](#) (MATLAB/Octave)

Software Skills and Experiences

PSIM · PSPICE · EMPT — Simulators for circuits · electronics devices · power systems

L^AT_EX · HTML · Office tools (e.g., Microsoft Office · Photoshop · Illustrator)

Hardware Experiences

Micro-controllers, e.g., DSP

Designing and debugging analog (power electronics) circuits

MATHEMATICAL WRITINGS & ACTIVITIES

Study Notes on Measures and Integrations

[Notes](#) on Folland, G.B. (2013). Real Analysis: Modern Techniques and Their Applications. John Wiley & Sons.

Lee, J. (2022). [Real Analysis, Probability, and Random Processes with Measure Theory](#). In progress.

Member of Mathematics Stack Exchange

16 questions and 8 answers posted · 906 reputation points earned (top 27% overall).

[\[profile\]](#)

PROFESSIONAL SERVICE ACTIVITIES

Reviewer of

[Automatica](#) (16 reviews) · [IEEE Trans. Cybernetics](#) (12 reviews) · [IEEE Trans. NNLS](#) (7 reviews)
[IEEE Trans. Automatic Control](#) (3 reviews) · [IJCAS](#) (20 reviews) · [Journal of ICROS](#) (4 reviews)
[Neurocomputing](#) (1 review) · [IEEE Control Systems Letters](#) (1 review)

Reviewer of Conference Articles in Proceedings of

[IEEE IV Symposium](#) · [IEEE ITSC](#) · [IEEE CDC](#) · [ACC](#) · [IEEE MSC](#)

Member of

[FormalISE 2022](#) Artifact Evaluation Committee (2022)

OTHER RESEARCH EXPERIENCES

Other Research Experiences in Control Fields:

Neural networks for control and system identification · (Robust adaptive) sliding mode control
 Vehicle(s) dynamics and control · Voltage- and current-mode control of power converters
 Time-delay systems · Linear matrix inequalities (LMIs)

Projects in Power Electronics & Power Systems

JULY 2010–JUNE 2011 Development of 1.5 kW high-efficiency DC-DC converter for auxiliary battery charging in electric vehicles – *LS Industrial Systems*

Surveyed & analyzed various DC-DC converters in terms of topology, control methods and efficiency
 Regarding the target interleaved dual-transformer DC-DC converter,
 Established its circuit and mathematical models
 Experimentally studied the dynamic/operational characteristics
 Designed current- and voltage-mode controllers

JUNE 2009–MAY 2012 Development for 22.9kV power cable fault diagnosis & traceability management system based on [TFDR](#) – *Ministry of Knowledge and Economy*

Analyzed the electric transfer characteristics of power cables using Gaussian chirp signals and [EMTP](#).
 Developed experimental environments for TFDR-based fault diagnosis of 22.9 kV power cables.

MAY 2009–APR. 2010 Development of an archimedes wave swing power system based on 4-sided linear generators – *Ministry of Knowledge and Economy*

Developed experimental environments of a miniature version for hardware verifications.

Conference & Workshop Attendance

[MODeM](#) (2021) · [IJCNN](#) (2021) · [NeuIPS](#) (2015, 2020) · [QEST](#) (2019) · [RLDM](#) (2017)
[IEEE CDC](#) (2009, 2010, 2011, 2014) · [ACC](#) (2013) · [ICCAS](#) (2010, 2013)
[ICS](#) (2014) · [KIEE CICS](#) (2008, 2014) · [KIEE Summer Conference](#) (2008, 2009, 2010, 2011, 2012, 2013)

Others

SEP. 2010–AUG. 2013 Korean military service – *Professional Research Agent at Yonsei University*

AWARDS AND SCHOLARSHIPS

Awards

- FEB. 2014 Academic Award in Natural Science, *Yonsei University*
 FEB. 2013 Brain Korea 21 TMS Best Paper Award: *Gold Prize, Yonsei University*
 NOV. 2012 Control Engineering Lab. Best Paper Award, *Yonsei University*

Scholarships

- SEP. 2007–FEB. 2013 Brain Korea 21 Scholarship – *Academic/Research Excellence, Yonsei University.*
 MAY 2013 LG PRI Scholarship – *Academic/Research Excellence, LG Production and Research Institute.*
 FEB. 2004–AUG. 2005 University Scholarship – *Academic Excellence (4/7 semesters), Kwangwoon University.*

ABBREVIATIONS

ACC	American Control Conference
CDC	Conference on Decision and Control
DQN	Deep Q-Network
ICROS	Institute of Control, Robotics, and Systems (제어로봇시스템학회)
IJCAS	International Journal of Control, Automation and Systems
IJCNN	International Joint Conference on Neural Networks
ITSC	Intelligent Transportation Systems Conference
IV	Intelligent Vehicles
Int J Control	International Journal of Control
JAAMAS	Journal of Autonomous Agents and Multi-Agent Systems
MODeM	Multi-Objective Decision Making
MSC	Multi-conference on Systems and Control
NNLS	Neural Networks and Learning Systems
QEST	Quantitative Evaluation of Systems
RLDM	Reinforcement Learning and Decision Making
TFDR	Time-Frequency Domain Reflectometry
TOMAC	Transactions on Modeling and Computer Simulation

FULL LIST OF PUBLICATIONS (* contributed equally)

Journal Articles

Constrained Reinforcement Learning for Safety-Critical Systems

0. [Uniformly Constrained Reinforcement Learning](#)

(2023) Lee, J.*, Sedwards, S.* & Czarnecki, K. *Accepted for publication in JAAMAS: Special Issue on MODeM.*

Deep Reinforcement Learning for Autonomous Driving

1. [Transfer Reinforcement Learning for Autonomous Driving: From WISEMOVE to WISESIM](#) (cited: 1) [git]

(2021) Balakrishnan, A., Lee, J., Gaurav, A., Czarnecki, K. & Sedwards, S. *ACM TOMAC*, 31(3), Article No. 15.

Reinforcement Learning, Dynamic Programming and Adaptive Optimal Control

2. [Policy Iterations for Reinforcement Learning Problems in Continuous Time and Space: Fundamental Theory & Methods](#)

(2021) Lee, J. & Sutton, R.S. *Automatica*, 126, 109421. (cited: 38, IF: 5.944). [arXiv | git]

3. [Adaptive Dynamic Programming for Discrete-Time LQR Based on Multirate Generalised Policy Iteration](#) (cited: 7)

(2018) Chun, T.Y., Lee, J.Y., Park, J.B. & Choi, Y.H. *Int J Control*, 91(6), 1223–1240.

4. [Integral Temporal Difference Learning for Continuous-Time Linear Quadratic Regulations](#) (cited: 6)

(2017) Chun, T.Y., Lee, J.Y., Park, J.B. & Choi, Y.H. *IJCAS*, 15(1), 226–238.

5. [Stability and Monotone Convergence of Generalised Policy Iteration for Discrete-Time Linear Quadratic Regulations](#) (2016) Chun, T.Y., Lee, J.Y., Park, J.B. & Choi, Y.H. *Int J Control*, 89(3), 437–450. (cited: 18).
6. [An Online Fault-Tolerant Actor-Critic Design for a Class of Nonlinear Systems Using Neural Network HJB Approach](#) (2015) Jang, S.J., Lee, J.Y., Park, J.B. & Choi, Y.H. *IJCAS*, 13(2), 311–318. (cited: 17).
7. [Integral Reinforcement Learning for a Class of Nonlinear Systems with Invariant Explorations](#) (cited: 109, IF: 14.255) (2014) Lee, J.Y., Park, J.B. & Choi, Y.H. *IEEE Trans. NNLS*, 26(5), 916–932. [preprint | git]
8. [On Integral Generalized Policy Iteration for Continuous-Time Linear Quadratic Regulations](#) (cited: 35, IF: 5.944) (2014) Lee, J.Y., Park, J.B. & Choi, Y.H. *Automatica*, 50(2), 475–489. [preprint]
9. [Integral Q-Learning and Explorized Policy Iteration for Adaptive Optimal Control of Continuous-Time Linear Systems](#) (2012) Lee, J.Y., Park, J.B. & Choi, Y.H. *Automatica*, 48(11), 2850–2859. (cited: 177, IF: 5.944). [preprint | git]
10. [Approximate Dynamic Programming for Continuous-Time Linear Quadratic Regulator Problems: Relaxation of Known Input Coupling Matrix Assumption](#) (cited: 14) (2012) Lee, J.Y., Park, J.B. & Choi, Y.H. *IET Control Theory and Applications*, 6(13), 2063–2075. [preprint]
11. [Explorized Policy Iteration for Continuous-Time Linear Systems](#) (in Korean) (2012) Lee, J.Y., Chun, T.Y., Park, J.B. & Choi, Y.H. *Transactions on KIEE*, 61(3), 451–458. [preprint]

Multi-Agent Inverse Optimal Consensus and Its Applications to Vehicles' Formation Control

12. [On Stability and Inverse Optimality for a Class of Multi-Agent Linear Consensus Protocols](#) (cited: 6) (2018) Lee, G.U., Lee, J.Y., Park, J.B. & Choi, Y.H. *IJCAS*, 16(3), 1194–1206.
13. [Design of Formation/velocity Consensus Protocol for Mobile Robots Based on LQ Inv. Optimal 2nd-Order Consensus](#) (2015) Lee, J.Y. & Choi, Y.H. *Journal of ICROS*, 21(5), 434–441. (cited: 1; in Korean) [preprint]
14. [LQ Inv. Optimal Consensus Protocol for Cont.-Time Multi-Agent Systems and Its Application to Formation Control](#) (2014) Lee, J.Y. & Choi, Y.H. *Journal of ICROS*, 20(5), 526–532. (cited: 4; in Korean) [preprint]

Lyapunov-Based Adaptive Control

15. [Nonlinear Adaptive Control Based on Lyapunov Analysis: Overview and Survey](#) (cited: 5; in Korean) (2014) Park, J.B. & Lee, J.Y. *Journal of ICROS: Special Issue on Technology Trends in Control, Robotics, and Systems*, 20(3), 261–269. [preprint]
16. [Adaptive Control for Input-Constrained Linear Systems](#) (cited: 12) (2012) Park, B.S., Lee, J.Y., Park, J.B. & Choi, Y.H. *IJCAS*, 10(5), 890–896.

Conference Proceedings

Distillation and Imitation of Deep Q-Network By Decision Tree, for Formal Verification

1. [Non-Divergent Imitation for Verification of Complex Learned Controllers](#) (cited: 1) (2021) Abdelzad, V.* , Lee, J.* , Sedwards, S.* , Soltani, S.* & Czarnecki, K. In: *2021 IJCNN*. Virtual. [video | slides]
2. [Improved Policy Extraction via Online Q-Value Distillation](#) (cited: 2) (2020) Jhunjunwala, A., Lee, J., Sedwards, S., Abdelzad, V. & Czarnecki, K. In: *2020 IEEE WCCI (IJCNN)*. Virtual.

Deep Reinforcement Learning (for Autonomous Driving)

3. [Predictive PER: Balancing Priority and Diversity Towards Stable Deep Reinforcement Learning](#) (cited: 1) (2021) Lee, S., Lee, J. & Hasuo, I. In: *2021 IJCNN*. Virtual.
4. [WISEMOVE: a Framework to Investigate Safe Deep Reinforcement Learning for Autonomous Driving](#) (2019) Lee, J.* , Balakrishnan, A.* , Gaurav, A.* , Czarnecki, K. & Sedwards, S.* In: *Parker D., Wolf V. (eds) QEST 2019*. Lecture Notes in Computer Science, vol. 11785. Glasgow, U.K. (cited: 18, including preprints). [arXiv | slides | git]

Reinforcement Learning, Dynamic Programming and Adaptive Optimal Control

5. [Policy Iteration for Discounted Reinforcement Learning Problems in Continuous Time and Space](#) (cited: 1) (2017) Lee, J.Y. & Sutton, R.S. In: *RLDM Extended Abstracts*, 148–152. Ann Arbor, MI, USA. [poster | slides]
6. [Separate Integral Q-Learning for Adaptive LQ-Optimal Control of Continuous-Time Linear Systems](#) (in Korean) (2014) Lee, J.Y., Park, J.B. & Choi, Y.H. In: *Proc. 2014 ICS*, 74–75.
7. [On Integral Value Iteration for Continuous-Time Linear Systems](#) (cited: 5) (2013) Lee, J.Y., Park, J.B. & Choi, Y.H. In: *Proc. 2013 ACC*, 4215–4220. Washington, DC, USA. [preprint]

8. [An Online Single-Network Adaptive Algorithm for Continuous-Time Nonlinear Optimal Control](#) [preprint] (2013) **Lee, J.Y.**, Park, J.B. & Choi, Y.H. In: *Proc. 13th ICCAS*, 1687–1690. Kwangju, South Korea.
9. [Integral Reinforcement Learning with Explorations for Continuous-Time Nonlinear Systems](#) (cited: 16) [preprint] (2012) **Lee, J.Y.**, Park, J.B. & Choi, Y.H. in: *2012 IJCNN (in 2012 IEEE WCCI)*. Brisbane, Australia.
10. [Comparisons of Continuous-Time and Discrete-Time Q-Learning Schemes for Adaptive Linear Quadratic Control](#) (2012) Chun, T.Y., **Lee, J.Y.**, Park, J.B. & Choi, Y.H. In: *2012 Proc. SICE Annual Conference*, 1228–1233. (cited: 3).
11. [Design of Integral-Type Adaptive LQ Controller Based on Continuous-Time Q-Learning](#) (in Korean) (2012) **Lee, J.Y.**, Park, J.B. & Choi, Y.H. In: *Proc. 43th KIEE Summer Conference*, 1293–1294.
12. [On Generalized Policy Iteration for Continuous-Time Linear Systems](#) (cited: 7) [preprint] (2011) **Lee, J.Y.**, Chun, T.Y., Park, J.B. & Choi, Y.H. In: *Proc. 50th IEEE CDC with ECC*, 1722–1728. Orlando, FL, USA.
13. [A Novel Generalized Value Iteration Scheme for Continuous-Time Linear Systems](#) (cited: 15) [preprint] (2010) **Lee, J.Y.**, Park, J.B. & Choi, Y.H. In: *Proc. 49th IEEE CDC*, 4637–4642. Atlanta, GA, USA.
14. [Policy-Iter.-Based Adaptive Optimal Control for Uncertain Continuous-Time Linear Systems with Excitation Signals](#) (2010) **Lee, J.Y.**, Park, J.B. & Choi, Y.H. In: *Proc. 10th ICCAS*, 464–651. Ilsan, South Korea. (cited: 8) [preprint]
15. [Online Q-Learning for Adaptive Optimal Control of DC Motor](#) (in Korean) (2010) Chun T.Y., **Lee, J.Y.**, Park, J.B. & Choi, Y.H. In: *Proc. 41th KIEE Summer Conference*, 1774–1775.
16. [Model-Free Approximate Dynamic Programming for Continuous-Time Linear Systems](#) (cited: 9) [preprint] (2009) **Lee, J.Y.**, Park, J.B. & Choi, Y.H. In: *Proc. 48th IEEE CDC held jointly with 28th CCC*, 5009–5014. Shanghai, China.
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