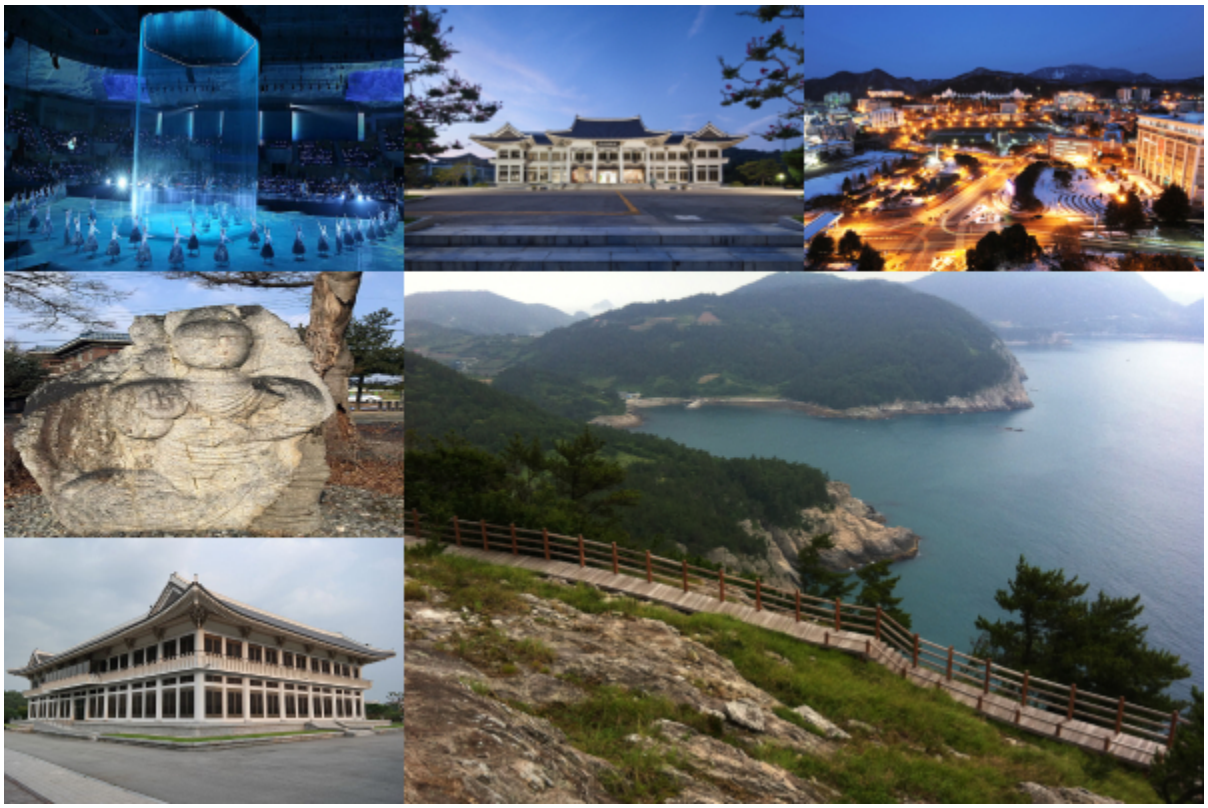
2020 Research in Adaptive and Convergent Systems (RACS 2020)

October 13-16, 2020
Chosun University, Gwangju, Korea

Final Program



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Conference at a Glance

Wednesday (Oct. 14)		
14:00~15:30	RACS Annual Meeting	TBD
16:00~17:30	Organization and Program Committee Business Meeting	TBD
18:30~21:00	Welcome Reception	TBD
Thursday (Oct. 15)		
09:00~	Conference Opening	Intl. Seminar Room
09:20~09:30	Conference Announcement	Intl. Seminar Room
09:30~10:20	Keynote Session	Online (Virtual)
10:20~10:50	Coffee Break	
10:50~12:30	Session 1: System Software & Networking	Intl. Seminar Room
12:30~14:00	Luncheon	
13:00~14:00	Posters Session	Intl. Seminar Room
14:00~15:40	Session 2: Artificial Intelligence & Algorithms	Intl. Seminar Room
15:40~16:10	Coffee Break	
16:10~17:30	Session 3: Database, Data Mining, & Software Engineering	Intl. Seminar Room
18:30~	RACS Banquet	TBD
Friday (Oct. 16)		
10:00~12:00	Future RACS Organization Meeting	TBD
12:00~13:00	Session Chairs Business Meeting	TBD
Conference Ends at 13:30		

Keynote

Title

(Virtual) New research directions in network anomaly detection: exploring chaotic and recurrent dynamics empowered by advanced machine learning practices

Speaker

Francesco Palmieri, University of Salerno, Dept. of Computer Science,

Abstract

With the ever increasing success of Internet-based technologies and their involvement in virtually any sector of our everyday's life, the need of detecting network-originated abuses for early alerting and timely reaction purposes assumes a paramount importance. However, the concept of normal or anomalous behavior when associated to network activities is extremely elusive and depends on a huge number of variable factors, often not immediately evident. Consequently, a new generation of self-learning models that adaptively consider and understand the hidden relationships between these factors and the innermost dynamics underlying the involved networks and applications, is needed in order to effectively recognize previously unknown security threats and react to them. This keynote outlines, by starting from an analysis of the most successful approaches available in literature, the recent research directions in network anomaly detection by focusing on the most challenging and promising ones.

This will be done by observing the problem from multiple perspectives, ranging from the traditional techniques, gathering knowledge about normal and anomalous events through a statistical idealization of past observations, to newer ones leveraging chaos theory, non-linear system dynamics and recurrence analysis. All these techniques are combined with several methodologies originally born in the machine-learning and artificial intelligence framework (e.g. neural networks, auto-encoders etc.), adapted and properly harmonized for providing a deterministic interpretation of the complex traffic dynamics associated to normal and anomalous events. Future research opportunities arise from the consideration that different properties and criteria could be applied for inferring more sophisticated traffic features that can be used to obtain a deeper and more comprehensive understanding about traffic profiles associated to security-related events.

Speaker's Bio

Francesco Palmieri is a full professor at the University of Salerno, Italy, where he received two Italian "Laurea" M.S. degrees and a PhD in computer science. Previously he has been an associate professor at the University of Salerno, an assistant professor at the Second University of Naples, and the Director of the telecommunication and networking division of the Federico II University, in Naples, Italy. At the start of his career, he also worked for several international companies on networking-related projects. He has been closely involved with the development of the Internet in Italy as a senior member of the Technical-Scientific Advisory Committee and of the CSIRT of the Italian NREN GARR. His major research interests concern high performance networking protocols and architectures, routing algorithms and network security. The actual focus of his scientific exploration and dissemination activity concern the use of soft computing, optimization and artificial intelligence technologies for solving challenging problems in the above areas. He has published a large number (more than 200) of papers in leading technical journals, books and conferences and currently serves as the editor-in-chief of an international journal (Journal of High Speed networks) and is part of the editorial board or associate editor of several other well reputed ones (i.e., IEEE Transactions on

Dependable and Secure Computing, Journal of Networks and Computer Applications, Information Sciences, Future generation Computer Systems, Applied Soft Computing, Soft Computing, International Journal of Intelligent Systems). He also guest edited many special issues in leading technical journals (i.e. IEEE Transactions on Industrial Informatics, Journal of Networks and Computer Applications, Information Sciences, and many others). In his career, he has been involved, by also assuming strategic roles, in several national and international research and network development projects. Finally, he participated to several technology transfer initiatives also involving leading companies operating in the networking and security sectors.

Thursday (October 15)

(S.1) System Software & Networking Thursday 10:50~12:30 Intl. Seminar Room

Session Chair : Chang Choi, Gachon University, Korea

1. (Virtual) A Cache Contention-aware Run-time Scheduling for Power-constrained Asymmetric Multicore Processors, Jian-He Liao, He-Ru Chen, and Ya-Shu Chen

2. (Virtual) A Machine-Learning-based Data Classifier to Reduce the Write Amplification in SSDs, Yi-Ying Lu, Chin-Hsien Wu, and Ya-Shu Chen

3. (Virtual) Toward Fast Platform-Aware Neural Architecture Search for FPGA-Accelerated Edge AI Applications, Yi-Chuan Liang, Ying-Chiao Liao, Chen-Ching Lin, and Shih-Hao Hung

4. (Virtual) Performance Evaluation of a GPU-based Monte Carlo Simulation Package for Water Radiolysis with sub-MeV Electrons, Min-Yu Tsai, Youfang Lai, Yujie Chi, Xun Jia, and Shih-Hao Hung

5. (Virtual) Design and Research of Permanent Magnet Synchronous Motor Controller and Protection System Based on FPGA, Guosheng Peng, Yufeng Chen, Zhengtao Xiang, Kai Che, Jinliang Zhang, and Lianbing Xu

6. (Virtual) Overheating-Avoidance Remapping Scheme for Reliability Enhancement of 3D PCM Storage Systems, Yu-Chen Lin, Tse-Yuan Wang, Che-Wei Tsao, Yuan-Hao Chang, Jian-Jia Chen, Xue Liu, and Tei-Wei Kuo

7. (Virtual) An Extrinsic Depth Camera Calibration Method for Narrow Field of View Color Camera, Chi-Sheng Daniel Shih and Hao-Yu Chen

8. (Virtual) A Three-Factor Mutual Authentication Scheme for Cyber-Physical Systems, Yung-Feng Lu, Chin-Fu Kuo, Hung-Ming Chen, Hsueh-Wen Tseng, Shih-Chun Chou, and Yu-Ming Liao

9. (Virtual) A Study of Load-Balancing Solutions of Mobile Cloud Computing for Next-Generation Mobile Applications, Rupak Kumar Das and Ahyoung Lee

10. (Virtual) Enhanced Privacy with Blockchain-based Storage for Data Sharing, Yung-Feng Lu, Hung-Ming Chen, Chin-Fu Kuo, Bo-Ting Chen, and Zong-Yan Dai

11. (Virtual) Secure and low computation authentication protocol for Wireless Body Area Network with ECC and 2D hash chain, Soohyeon Choi, Sangwon Shin, Xiaozhu Jin, and Sung Shin

12. (Virtual) LSTM Enabled Artificial Intelligent Smart Gardening System, Malik Muhammad Saad, Muhammad Toaha Raza Khan, Muhammad Ashar Tariq, and Dongkyun Kim

13. (In-person) Performance improvement of PCI Express adapter cards by adjusting the location of DMA functions, Kwangho Cha, Kyungmo Koo, and Hyun Mi Jung

14. (In-person) On Selecting a proper Neuromorphic Architecture based on the Parameter Size of SNN Models, Kicheol Park, Yena Lee, Jae-Hoon An, Bongjae Kim, and Jiman Hong

15. (In-person) Load Balancing for Machine Learning Platform in Heterogeneous Distribute Computing Environment, Younggwan Kim, Jusuk Lee, Ajung Kim, and Jiman Hong

16. (In-person) EDAroid : An Efficient Dynamic Analysis Tool for Android Applications, Heejin Kim, Kyuho Kim, Joongjin Kook, Junyoung Heo, and Jiman Hong

(S.2) Artificial Intelligence & Algorithms Thursday 14:00~15:40 Intl. Seminar Room

Session Chair : Junyoung Heo, Hansung University, Korea

1. (Virtual) Accelerating Variant Calling with Parallelized DeepVariant, Chih-Han Yang, Jhih-Wun Zeng, Cheng-Yueh Liu, and Shih-Hao Hung

2. (Virtual) Using Synthesized Data to Train Deep Neural Net with Few Data, Cheng-Shao Chiang and Chi-Sheng Daniel Shih

3. (Virtual) Sequence to Sequence CycleGAN for Non-Parallel Sentiment Transfer with Identity Loss Pretraining, Ida Ayu Putu Ari Crisdayanti and Jee-Hyong Lee

4. (Virtual) Adversarially-learned Image Transfer Model for Multi-content Disentanglement, Hoyong Seo and Jee-Hyong Lee

5. (Virtual) Multimodal Neuroimaging Game Theoretic Data Fusion in Adversarial Conditions, Christian Esposito, Oscar Tamburis, and Chang Choi

6. (Virtual) Kernel-controlled DQN based CNN Pruning for Model Compression and Acceleration, Romancha Khatri and Kwanghee Won

7. (Virtual) Semantic Classification of EMF-related Literature using Deep Learning Models with Attention Mechanism, Kwanghee Won, Youjeong Jang, Hyung-do Choi, and Sung Shin

8. (In-person) Learning Multi-modal Representations of Narrative Multimedia: a Case Study of Webtoons, O-Joun Lee and Jin-Taek Kim

9. (In-person) Gender Classification from Fingerprint-images using Deep Learning Approach, Beanbonyka Rim, Junseob Kim, and Min Hong

10. (In-person) Solving the Multi-class Classification Task in Spiking Neural Network by using Supervised Spiking Learning Rule with a Consistent Competitive Mechanism, Viet-Ngu Cong Huynh and Keon Myung Lee

11. (In-person) Analysis of commercial drone sounds and its identification, Sinwoo Yoo and Hyukjun Oh

12. (In-person) A study of the estimation of Stroke ASPECTS Scores based on NCCT brain scan images using deep learning, Sumin Jung and Taeg-Keun Whangbo

13. (In-person) Data Augmentation and D-vector Representation Methods for Speaker Change Detection, Jisu Park, Shin Cha, Seongbae Eun, Jeon Gue Park, and Young-Sun Yun

14. (In-person) Channel-Wise Attention and Channel Combination for Knowledge Distillatio, Chan Sik Han and Keon Myung Lee

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(S.3) Database, Data Mining, & Software Engineering

Thursday 16:10~17:50 Intl. Seminar Room

Session Chair : Hoon Ko, Chosun University, Korea

1. (Virtual) PerfNet: Platform-Aware Performance Modeling for Deep Neural Networks, Chuan-Chi Wang, Ying-Chiao Liao, Ming-Chang Kao, Wen-Yew Liang and Shih-Hao Hung

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2. (Virtual) Content-Based Collaborative Filtering Using Word Embedding: A Case Study on Movie Recommendation, Luong Vuong Nguyen, Tri-Hai Nguyen, and Jason J. Jung

3. (Virtual) Modeling User Loyalty for Korean Political YouTube Channels, Giang T.C. Tran, Luong Vuong Nguyen, Jason J. Jung, and Jeonghun Han

4. (Virtual) Discovering Synergic Association by Feature Clustering from Soccer Players, Geon Ju Lee, Gen Li, and David Camacho, and Jason J. Jung

5. (Virtual) Modifications using Circular Shift for a Better Bloom Filter, Myeong-Kyu Kim and Sung-Ryul Kim

6. (Virtual) Motion Mode Recognition for Traffic Safety in Campus Guiding Application, Rukang Yan, Zhan Gao, Lianbing Xu, Lei Cai, Zhengtao Xiang, and Yufeng Chen

7. (Virtual) Evading a Machine Learning-based Intrusion Detection System through Adversarial Perturbations, Torgeir Fladby, Hårek Haugerud, Stefano Nichele, Kyrre Begnum, and Anis Yazidi

8. (Virtual) Mapping Study on Constraint Consistency Checking in Distributed Enterprise Systems, Tomas Cerny, Andrew Walker, Jan Svacina, Vincent Bushong, Dipta Das, Karel Frajtak, Miroslav Bures, and Pavel Tisnovsky

9. (Virtual) On Vulnerability and Security Log analysis: A Systematic Literature Review on Recent Trends, Jan Svacina, Jackson Raffety, Connor Woodahl, Brooklynn Stone, Tomas Cerny, Miroslav Bures, Dongwan Shin, Karel Frajtak, and Pavel Tisnovsky

10. (Virtual) On Matching Log Analysis to Source Code: A Systematic Mapping Study, Vincent Bushong, Russell Sanders, Jacob Curtis, Mark Du, Tomas Cerny, Karel Frajtak, Miroslav Bures, Pavel Tisnovsky, and Dongwan Shin

11. (Virtual) Failure Prediction by Utilizing Log Analysis: A Systematic Mapping Study, Dipta Das, Micah Schiewe, Elizabeth Brighton, Mark Fuller, Tomas Cerny, Miroslav Bures, Karel Frajtak, Dongwan Shin, and Pavel Tisnovsky

12. (In-person) Developing IoT Applications Using Spiking Neural Networks Framework, Seoyeon Kim, Jaehyeok Jeong, Jaehee Kim, Young-Sun Yun, Bongjae Kim, and Jinman Jung

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Posters Session Thursday 13:00~14:00 Intl. Seminar Room

Session Chair : Bongjae Kim, Sun Moon University, Korea

1. (Virtual) Road Surface Profiling based on Artificial-Neural Networks, Seungho Choi, Seoyeon Kim, Heelim Hong, and Young Bin Kim

2. (In-person) Design and Implementation of Analytical Load Balancing between Distributed Collaborative Container Platforms, Jae-Seung Han, Jae-Hoon An, and Younghwan Kim

3. (In-person) Design and Implementation an OpenMCP distributed collaborative container platform for flexible scaling and service delivery, Chanhyup Kim, Jae-Hoon An, and Younghwan Kim

4. (In-person) Design and Implementation of Migration Manager between Cloud Edge Platforms, Taehyuk Heo, Jae-Hoon An, and Younghwan Kim

5. (In-person) Migration Selection Method using two Factors based LSTM in Micro Datacenter, Su June Lee, Jae-Hoon An, and Younghwan Kim

6. (In-person) Scheduler for Distributed and Collaborative Container Clusters based on Multi-Resource Metric, Yena Lee, Jae-Hoon An, and Younghwan Kim

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7. (In-person) Spiking Neural Network Transformer for Deploying into a Deep Learning Framework, Chan Sik Han and Keon Myung Lee

8. (In-person) An Automated Machine Learning Platform for Non-experts, Jin Han, Ki Sun Park, and Keon Myung Lee

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Venue

- International Seminar Room (2nd Floor), College of IT Convergence Engineering, Chosun University, Korea

- 309, Pilmun-daero, Dong-gu, Gwangju, Republic of Korea, 61452