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Title: A Two-Level Active Defense Approach to Detecting Unknown Vulnerabilities in Smart Contracts

Abstract: Blockchain is a very promising technology that may become a decentralized computing platform for future Internet. However, currently it faces a lot of security risks impacting almost all aspects of Blockchain systems and applications. In order to mitigate security risks from the perspective of smart contracts of Blockchain, we proposed a Two-Level Active Defense Approach to Detecting Unknown Vulnerabilities in Smart Contracts (AdaVul for short): Our First Level Active Defense Approach removes those smart contracts that may contain known vulnerabilities through DApp recommendations, and our Second Level Active Defense Approach detects unknown vulnerabilities in smart contracts based on the idea that opcode sequences of Ethereum transactions containing unknown vulnerabilities may have similarities to those containing known vulnerabilities.

Short-Bio: Guojun Wang received B.Sc. degree in Geophysics, M.Sc. degree in Computer Science, and Ph.D. degree in Computer Science, at Central South University, China, in 1992, 1996, 2002, respectively. He is a Pearl River Scholarship Distinguished Professor of Higher Education in Guangdong Province, a Doctoral Supervisor of

School of Computer Science and Cyber Engineering, Guangzhou University, China, and the Director of Institute of Computer Networks at Guangzhou University. He has been listed in Chinese Most Cited Researchers (Computer Science) by Elsevier in the past eight consecutive years (2014-2021). His h-index is 60 (as of the date June 18, 2022). He had been a Professor at Central South University, China; an Adjunct Professor at Temple University, USA; a Visiting Scholar at Florida Atlantic University, USA; a Visiting Researcher at the University of Aizu, Japan; and a Research Fellow at the Hong Kong Polytechnic University, Hong Kong SAR, China. His research interests include artificial intelligence, big data, cloud computing, Internet of Things (IoT), blockchain, Risk Evaluation, trustworthy/dependable computing, network security, privacy preserving, recommendation systems, smart cities, and medical information systems. He has published more than 400 technical papers and books/chapters in the above areas, including top international journals like ACM TAAS/TOSN/CSUR and IEEE TC/TPDS/TDSC, and top international conferences like CCS/WWW/INFOCOM/CIKM/DSN/ESORICS. His research is supported by the Key Project of the National Natural Science Foundation of China, the National Key Research and Development Program of China, the National High-Tech Research and Development Plan of China (863 Plan), the Ministry of Education Fund for Doctoral Disciplines in Higher Education, the Guangdong Provincial Natural Science Foundation, the Hunan Provincial Natural Science Foundation, and the Hunan Provincial Science and Technology Program. His research is also supported by talents programs including the Program for Pearl River Scholarship Distinguished Professor of Higher Education in Guangdong Province, the Hunan Provincial Natural Science Foundation of China for Distinguished Young Scholars, and the Program for New Century Excellent Talents in University. He is a recipient of a number of science and technology awards, including the 2018 Special Government Allowances of the State Council, the 2018 Guangzhou Municipal Excellent Experts, the 2014 First Prize of the National Natural Science Award (name in the 5th place), the 2014 Second Prize of the Hunan Provincial Natural Science Award (name in the 1st place), the 2013 and 2003

First Prize of two Natural Science Awards of Ministry of Education of China (name in the 4th and 5th places, respectively), and a number of Best Paper Awards in the international conferences, including iSCI 2019, IEEE UIC 2018, IEEE IoP 2018, IEEE ISPA 2013, and IEEE TrustCom 2010. He is an associate editor or on editorial board of some international journals including IEEE Transactions on Parallel and Distributed Systems (TPDS), Security and Communication Networks (SCN), International Journal of Parallel, Emergent and Distributed Systems (IJPEDS), and International Journal of Computational Science and Engineering (IJCSE).

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