Career Introduction

Professor Nobuhiro Shimoi
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Nobuhiro Shimoi began work at TOSHIBA Corporation Manufacturing Engineering Research Institute and the KEIHIN office of the Robotics and Mechanical Engineering during 1983–1988 after work at the Ministry of Health, Lab our and Welfare Incorporated Administrative Agency, Polytechnic University. In addition, he worked at Technology Research and Development Institute of the Ministry of Defense as an Engineering Researcher during 1988–1997. In September 17, 1996, he earned his doctorate in engineering from the Graduate School of Engineering, National University of Shinshu. He was engaged as a researcher in sensor systems for mine detection and demining.

During 1992–2005, he contributed to solving international difficulties posed by antipersonnel landmines. Directed by the Prime Minister's Office of the Government of Japan, he took active leading positions of IEEE-sponsored academic societies with research into humanitarian landmine detection and removal technologies for eliminating antipersonnel landmines. Representative achievements [(1)-(11),(28),(43),(44)] are presented in publications and his book, “Technology campaign for banned land mines,” Morikita Publishing Co., Ltd. As a technical advisor to Japan Campaign Ban Land Mine (JCBL) of the Nobel Peace Prize-winning NGO, he also contributed to landmine eradication as outlined partially in Proceedings [(53)–(57) ,(60)-(72)] and Patents [(109)-(118)].

During 1997–2008, he served as an Associate Professor at the National Tokyo College of Technology Department of Mechanical Engineering. From April 1998, he was a Part-time Lecturer (concurrent post) at Tokyo Metropolitan University, Faculty of Engineering. From September 1999, he was an Inland Researcher, of Ministry of Education, Culture, Sports, Science and Technology (MEXT) at the Faculty of Engineering Chiba University. From December 2000 through March 2005, he was an Overseas Researcher of MEXT for Computing Sciences at Alberta University, during study abroad in Canada.

The achievement is represented by landmine monitoring technology using walking and mobile robots, as described in reports [(6)–(11),(27),(43),(44)] ,proceedings [(54)-(57), (66)–(72)] and Patents [(111)-(120)].

From 2008 to the present, he has worked as a Professor at Akita Prefectural University Faculty of Systems Science and Technology. During 2013–2019, he was engaged in robot research to address "Elderly observation difficulties" because of declining labor force because of Japan’s lower birthrates and aging population, which pose social problems in economically developed countries. The achievement is represented by bed monitoring technology using observation robots, as described in reports [(12)–(13) (16),(17) , (29),(30),(33)-(36),(45)-(52)] and proceedings [(74),(77)-(81,(91),(97)]. These results have been used practically as a technological invention by multiple companies, in facilities for elderly people, and in homes worldwide: Patents [(120)-(122)].

Moreover, from 2008 to the present, the "50-year infrastructure" has loomed as a difficulty in economically developed countries. Japan's social capital stock was accumulated and concentrated during its era of high economic growth. Its future deterioration is a mounting concern. Over the next 20 years, increasingly decrepit facilities 50 years old or older will become commonplace.

His work represents engagement in research on monitoring technologies and development of related equipment and devices for early detection of bridge and tunnel risk of collapse, with representative

achievements presented in reports [18]-[26],[31],[32][37],patents [122]-[126] and other media. Using only about one-twentieth of the resources of conventional evaluation, piezoelectric limit sensor evaluation using sensor output can evaluate structures using the "SALLY" measurement robot and assessing sensor characteristics and improve reliability, as described in reports [24]–[26], proceedings [82],[88],[95],[106]-[108] and patents [126].
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