

NATIONAL MILITARY UNIVERSITY "VASIL LEVSKI"

ESTONIAN UNIVERSITY OF LIFE SCIENCES

VIDZEME UNIVERSITY OF APPLIED SCIENCES

GREEN FUTURE TECHNOLOGIES

Proceedings of the International Conference
**Secure Systems Design and Technology
Development (SysTechDev)**
25–26 June 2026

Volume III

Veliko Tarnovo, Bulgaria
2026

Secure Systems Design and Technology Development (SysTechDev). Proceedings of the 1st International Scientific Conference, June 25–26, 2026. *Volume III*. National Military University "Vasil Levski", Veliko Tarnovo, Bulgaria, 2026. 415 pp.

The three-volume proceedings of the 1st International Scientific Conference "Secure Systems Design and Technology Development (SysTechDev)" present the latest research in defense and security technologies, engineering sciences and production technologies, information technologies, sustainable energy engineering and applications, laser technologies, materials science, mechanics, metalworking, mathematical modelling, and electrical engineering.

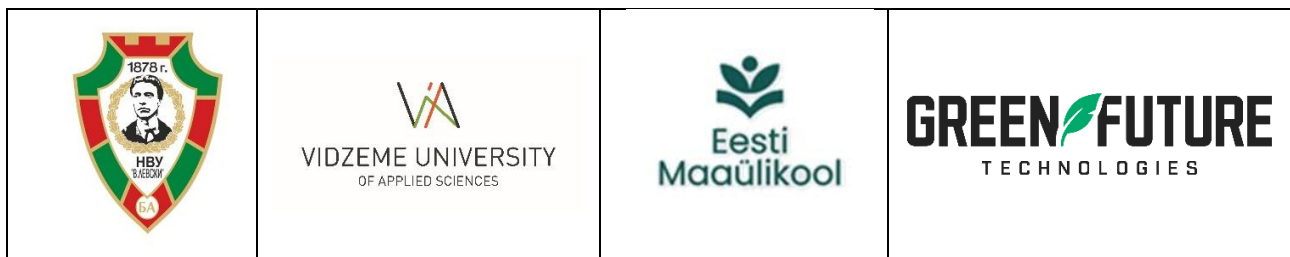
The conference is interdisciplinary, bringing together the achievements of international research teams. The scope of the studies presented in these proceedings is broad and multidisciplinary, reflecting the results of collaborative research conducted by scientists from different countries.

The conference proceedings include 196 scientific papers, with participants representing 16 countries.

The 1st International Scientific and Practical Conference on Secure Systems Design and Technology Development (SysTechDev) took place at the National Military University "Vasil Levski" in Veliko Tarnovo, Bulgaria, on June 25–26, 2026.

<https://etrconf.eu/>

Link to conference proceedings: <https://journal.etrconf.eu/std/issue/archive>



This journal is licenced under
[Creative Commons Attribution 4.0 International \(CC BY 4.0\) License](https://creativecommons.org/licenses/by/4.0/)
The author of the paper takes responsibility for the content of the paper



Online ISSN 3044-7771

Published by Green Future Technologies SIA, 2026

Scientific Committee Co-Chairman

Dr.sc.ing. Lyubomir Lazov, Rezekne Academy of Riga Technical University, Latvia
PhD Nikolay Dolchinkov, "Vasil Levski" National Military University, Bulgaria
PhD Mart Hovi, Estonian University of Life Sciences, Estonia
Dr.sc.ing. Artis Teilāns, Vidzeme University of Applied Sciences, Latvia

Scientific Committee

PhD Sherif Ibrahim Abdel-Wahab, Agricultural Research Center, Giza, Egypt
PhD prof. Tamer Ibrahim Abdel-Wahab, Agricultural Research Center, Giza, Egypt
PhD prof. Hikmat Almadhkhori, Al-Mustansiriyah University, Baghdad, Iraq
PhD Nikolaj Angelov, Technical University of Gabrovo, Bulgaria
PhD Kiril Anguelov, Technical University of Sofia, Bulgaria
PhD Andres Annuk, Estonian University of Life Sciences, Estonia
PhD Ekaterina Arabska, Higher School of Agribusiness and Regional Development, Bulgaria
PhD Wael Badawy, International Atomic Energy Agency, Egypt
PhD Stefan Bankov, The Ministry of Interior of Bulgaria, Bulgaria
PhD Plamen Bogdanov, University of Library Studies and Information Technologies, Bulgaria
PhD Hamid Can, Trakya University, Turkey
PhD Arnis Cīrulis, Vidzeme University of Applied Sciences, Latvia
PhD Dimitar Dimitrov, Todor Kableshkov University of Transport, Bulgaria
PhD Nadezhda Dimova, New Bulgarian University, Bulgaria
PhD Tamar Dolbaia, Tbilisi State University, Georgia
PhD Nikolay Dolchinkov, "Vasil Levski" National Military University, Bulgaria
PhD Nino Durglishvili, Tbilisi State University, Georgia
Dr.sc.ing. Aleksandrs Gorbunovs, Riga Technical University, Latvia
Dr.sc.ing. Pēteris Grabusts, Rezekne Academy of Riga Technical University, Latvia
PhD Gilbert-Rainer Gillich, University Babes-Bolyai, Romania
PhD Grigor Grigorov, "Vasil Levski" National Military University, Bulgaria
PhD Mariusz Gontarczyk, Military University of Technology, Poland
PhD Tzvetelin Gueorguiev, Technical University of Gabrovo, Bulgaria
PhD Alexandru Herciu, „CAROL I” National Defense University, Romania
PhD Mart Hovi, Estonian University of Life Sciences, Estonia
PhD Valery Ivanov, Defense Institute "Professor Tsvetan Lazarov", Bulgaria
DSc Maria Ilcheva, Saint Cyril and Methodius University of Veliko Tarnovo, Bulgaria
Dr.sc.ing. Aivars Kaķītis, Latvia University of Life Sciences and Technologies, Latvia
PhD Georgi Kamarashev, Saint Cyril and Methodius University of Veliko Tarnovo, Bulgaria
Dr.paed. Ilmārs Kangro, Rezekne Academy of Riga Technical University, Latvia
PhD Atis Kapenieks, Riga Technical University, Latvia
Dr. paed. Janis Kapenieks, Riga Technical University, Latvia
PhD Stancho Kajkov, "Vasil Levski" National Military University, Bulgaria
PhD Anna Khilya, Vinnytsia Mykhailo Kotsiubynskyi State Pedagogical University, Spain
PhD Noah Ugur Kilinc, Piri Reis University, Istanbul, Turkey
PhD Georgi Komitov, Agricultural University Plovdiv, Bulgaria
PhD Lazar Lazarov, "Vasil Levski" National Military University, Bulgaria
Dr.sc.ing. Lyubomir Lazov, Rezekne Academy of Riga Technical University, Latvia
PhD Lyuboslav Lyubenov, University of Ruse "Angel Kanchev", Bulgaria

PhD Wilmer Orlando López González, Universidad Nacional de Educación, Ecuador
 PhD Tatyana Maglyovana, National University of Civil Protection of Ukraine, Ukraine
 Dr.sc.math. Maksims Marinaki, University of Latvia, Latvia
 PhD Rumen Marinov, "Vasil Levski" National Military University, Bulgaria
 PhD Georgi Marinov, Rakovski National Defence College, Bulgaria
 PhD Dilyan Markov, Georgi Rakovski Military Academy, Bulgaria
 PhD Otakar Jiří Mika, Police Academy and South Bohemian University, Czech Republic
 PhD Gregg Tyler Milligan, University of Canton, United States
 PhD Cristian Emil Moldoveanu, Military Technical Academy "Ferdinand I", Romania
 Dr.sc.ing. Marufjon Musaeu, Tashkent State Technical University, Uzbekistan
 PhD Serhii Naida, Igor Sikorsky Kyiv Polytechnic Institute, Ukraine
 PhD Nikolay Nichev, Georgi Benkovski Higher Military Air School, Bulgaria
 PhD Plamen Pavlov, School of Telecommunications and Posts, Bulgaria
 Dr.sc.ing. Desislava Petrova, Technical University of Gabrovo, Bulgaria
 PhD Dimcho Pulov, Technical University of Gabrovo, Bulgaria
 PhD Prof. Vesela Radovic, University of Belgrade, Serbia
 PhD Tomas Rozsypal, University of Defence, Czech Republic
 PhD Rashmi Jaymin-Sanchaniya, Riga Technical University, Latvia
 PhD Yehya A. Salih, Head of Department at University of Basrah, Iraq
 PhD Iryna Sarancha, Vinnytsia Mykhailo Kotsiubynskyi State Pedagogical University, Ukraine
 PhD Barbara Sawicka, University of Life Sciences in Lublin, Poland
 PhD Dafinka Sidova, New Bulgarian University, Bulgaria
 Dr.sc.ing. Andris Skromulis, Rezekne Academy of Riga Technical University, Latvia
 Dr.sc.ing. Adiljan Suleymanov, Tashkent State Technical University, Uzbekistan
 Dr.-Ing. Bambang Soemardiono, Institut Teknologi Sepuluh Nopember, Indonesia
 Dr.sc.ing. Artis Teilāns, Vidzeme University of Applied Sciences, Latvia
 PhD Ērika Teirumnieka, Rezekne Academy of Riga Technical University, Latvia
 Dr.biol. Rasma Tretjakova, Rezekne Academy of Riga Technical University, Latvia
 PhD Antonios Valamontes, Research Director at Kapodistrian Academy of Science, United States
 PhD Sergij Vambol, National Technical University, Kharkiv Polytechnic Institute, Ukraine
 PhD Viola Vambol, University of Yuri Kondratyuk Poltava Polytechnic National University, Ukraine
 PhD Valentin Vassilev, New Bulgarian University, Bulgaria
 PhD Algazy Zhauyt, Almaty University of Power Engineering and Telecommunications, Kazakhstan
 Dr.sc.ing. Inga Zinicovscaia, Horia Hulubei National Institute for Physics and Nuclear Engineering, Romania

Organising Committee Chairman

PhD Nikolay Dolchinkov, "Vasil Levski" National Military University, Bulgaria

Organising Committee

Aigars Abrickis, Green Future Technologies SIA, Latvia
 MA Yanitsa Boyanova, "Vasil Levski" National Military University, Bulgaria
 Dr.sc.ing. Aleksandrs Gorbunovs, Riga Technical University, Latvia
 MA Georgi Hristov, "Vasil Levski" National Military University, Bulgaria
 PhD Ērika Teirumnieka, Rezekne Academy of Riga Technical University, Latvia
 MA Svetoslav Pashunov, "Vasil Levski" National Military University, Bulgaria

Reviewers

PhD Andres Annuk - Estonian University of Life Sciences, Estonia
PhD Dimitar Angelski, Forestry Technical University, Bulgaria
PhD Svilena Arabadzhieva, Academy of the Ministry of Interior, Bulgaria
PhD Plamen Atanasov, New Bulgarian University, Bulgaria
PhD Stefan Bankov, The Ministry of Interior of Bulgaria, Bulgaria
PhD Daniel Berchev, "Vasil Levski" National Military University, Bulgaria
PhD Rosen Bogdanov, "Vasil Levski" National Military University, Bulgaria
PhD Olga Borisova, Varna Free University Chernorizets Hrabar, Bulgaria
PhD Erol Buyukliev, Rakovski National Defence College, Bulgaria
PhD Arnis Cīrulis, Vidzeme University of Applied Sciences, Latvia
PhD Aija Cunska, Vidzeme University of Applied Sciences, Latvia
PhD Iveta Daugule, University of Latvia, Latvia
PhD Dilyana Dimitrova, Nikola Vaptsarov Naval Academy, Bulgaria
PhD Desislava Dimitrova, Technical University of Varna, Bulgaria
PhD Nikolay Dolchinkov, "Vasil Levski" National Military University, Bulgaria
PhD Kliment Georgiev, Technical University of Sofia, branch Plovdiv, Bulgaria
PhD Pēteris Grabusts, Riga Technical University, Latvia
PhD Aleksandrs Gorbunovs, Riga Technical University, Latvia
PhD Iliayn Hutov, Defense Institute "Professor Tsvetan Lazarov", Bulgaria
PhD Mart Hovi, Estonian University of Life Sciences, Estonia
PhD Maria Ilcheva, Saint Cyril and Methodius University of Veliko Tarnovo", Bulgaria
PhD Martins Jansevskis, Vidzeme University of Applied Sciences, Latvia
PhD Oskars Java, Vidzeme University of Applied Sciences, Latvia
PhD Sandra Kaija, Riga Stradiņš University, Latvia
PhD Ilmārs Kangro, Rezekne Academy of Riga Technical University, Latvia
PhD Atis Kapenieks, Riga Technical University, Latvia
PhD Kiril Lengerov, TU Sofia, branch Plovdiv, Bulgaria
PhD Lyuboslav Lyubenov, University of Ruse "Angel Kanchev", Bulgaria
PhD Dilyan Markov, Georgi Rakovski Military Academy, Bulgaria
PhD Ventsislava Nikolova-Minkova, Technical University of Gabrovo, Bulgaria
PhD Daniela Pavlova, University of Library Studies and Information Technologies, Bulgaria
PhD Nikolay Padarev, "Vasil Levski" National Military University, Bulgaria
PhD Penyo Penev, "Georgi Benkovski" Bulgarian Air Force Academy, Bulgaria
PhD Desislava Petrova, Technical University of Gabrovo, Bulgaria
PhD Dimcho Pulov, Technical University of Gabrovo, Bulgaria
PhD Hristo Radev, Technical University of Gabrovo, Bulgaria
PhD Zhaneta Savova, National Military University, Bulgaria
PhD Dafinka Sidova, New Bulgarian University, Bulgaria
PhD Krasimir Slavyanov, "Vasil Levski" National Military University, Bulgaria
PhD Milko Stefanov, Rakovski National Defense College, Bulgaria
PhD Ivan Tashev, Technical University Sofia, branch Plovdiv, Bulgaria
PhD Tsvetoslav Tsankov, Konstantin Preslavsky University of Shumen, Bulgaria
PhD Kostadin Trifonov, University of Transport Todor Kableshkov, Bulgaria
PhD Valentin Vassilev, South-West University "Neofit Rilski", Bulgaria
PhD Stoyan Vergiev, Technical University of Varna, Bulgaria
PhD Beata Vlahova, National Military University Vasil Levski, Bulgaria
PhD Emil Yankov, University of Ruse, Bulgaria
PhD Tsanka Zlateva-Petkova, Technical University of Gabrovo, Bulgaria