



## *CURRICULUM VITAE*

### PERSONAL INFORMATION

#### **Liviu-Cristian MATACHE**

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 [liviu.matache@mta.ro](mailto:liviu.matache@mta.ro)

Date of birth 12 November 1978 | Nationality Romanian

### WORK EXPERIENCE

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- February 2024 – present    Vice Dean for International Relations/Faculty of Integrated Armament Systems, Military Engineering and Mechatronics  
Military Technical Academy, Bucharest (Romania)  
Management, teaching, scientific research and academic activities in the military field  
**Business or sector** Military research and academic
- February 2024 – present    University Professor / Mechatronics and Integrated Armament Systems / Armament Systems Engineering and Mechatronics Department  
Military Technical Academy, Bucharest (Romania)  
Teaching, scientific research and academic activities in the military field  
**Business or sector** Military research and academic
- December 2021 – present    Head of project management and quality assurance department  
Military Technical Academy, Bucharest (Romania)  
Management, research and academic activities in the military field  
**Business or sector** Military research and academic
- May 2021 – December 2021    Head of technological development center  
Military Technical Academy, Bucharest (Romania)  
Management, research and academic activities in the military field  
**Business or sector** Military research and academic
- December 2019 – May 2021    Head of project management and quality assurance department  
Military Technical Academy, Bucharest (Romania)  
Management, research and academic activities in the military field  
**Business or sector** Military research and academic
- November 2018 – November 2019    Scientific researcher 2<sup>nd</sup> degree  
Military Technical Academy, Bucharest (Romania)  
Research and academic activities in the military field  
**Business or sector** Military research and academic

May 2009 – October 2018	<p><b>Head of Explosive Department</b>  Ministry of National Defence - Scientific Research Center for CBRN Defense and Ecology /METRA, Bucharest (Romania)  Management, testing and research activities in the military field  Business or sector Military research</p>
November 2004 – May 2009	<p><b>Scientific researcher</b>  Ministry of National Defense – Military Equipment and Technologies Research Agency (METRA)  Research, tests and evaluation activities  Business or sector Military research</p>
August 2002 – November 2004	<p><b>Specialist officer</b>  Ministry of National Defence – Military Firing Range for Test and Evaluation of Munitions  Organisation and execution of testing and evaluation of armament and munition  Business or sector Military research</p>

## EDUCATION AND TRAINING

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2003 – 2010	<p><b>PhD</b>  Military Technical Academy, Bucharest (Romania)  Contribution to the study of air shock waves generated by weapon systems on firing</p>	Post-university
2006	<p><b>Formation and improvement course in the Management of the research-development projects from the national defence system</b>  University of National Defence “Carol I”, Bucharest (Romania)</p>	Post-university
2002 - 2004	<p><b>Master degree</b>  Military Technical Academy, Bucharest (Romania)  Munitions and Explosives Systems Engineering</p>	Post-university
1997 - 2002	<p><b>Officer Engineer</b>  Military Technical Academy , Bucharest (Romania)  Mechanical engineer in ammunition, rocket and explosives</p>	University
2014	<p><b>Expert training</b>  Organization for the Prohibition of Chemical Weapons, Pribram (Czech Republic)  Detection of Chemical Warfare Agents and related compounds, risk management and actions to be taken in Chemical Defense based on expertise</p>	

## PERSONAL SKILLS

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Mother tongue(s)	Romanian
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Other language(s)	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	B2	B2	B2	B2	B2

Levels: A1/A2: Basic user - B1/B2: Independent user - C1/C2: Proficient user  
[Common European Framework of Reference for Languages](#)

#### ADDITIONAL INFORMATION

- Paperwork
1. Rotariu, A.N., Trana, E., **Matache, L.C.**, Homutescu, T., „*A HiLo interior ballistic model based on the hypothesis of gases adiabatic transformation in the high pressure chamber*”, CASE STUDIES IN THERMAL ENGINEERING Volume 45, Article Number 102928, DOI 10.1016/j.csite.2023.102928, ISSN: 2214-157X.
  2. Pulpea, D, Pulpea, BG, **Matache, L**, Rotariu, A, Toader G, Rotariu, T, Dirloman, F, Somoia, P, Podaru, A, Ungureanu, MI, „*Mechanical proprieties of peelable coatings employed for CBRN decontamination*”, UPB Scientific Bulletin, Series B: Chemistry and Materials Science Volume 85 Issue 1, Pages: 153-164, 2023, ISSN 1454-2331.
  3. Rotariu, AN, Trana, E, **Matache, L**, „*Young's Modulus Calculus Using Split Hopkinson Bar Tests on Long and Thin Material Samples*”, MATERIALS Volume 15, Issue 9, Article Number: 3058, DOI: 10.3390/ma15093058, ISSN: 1996-1944.
  4. Ungureanu, Mihai-Ionuț, **Matache, Liviu-Cristian**, Rotariu, Traian, Barbu, Cristian, Dîrloman, Florin-Marian, „*High blast explosive composition for annular thermobaric ammunitions*”, UPB Scientific Bulletin, Series B: Chemistry and Materials Science Volume 83 Issue 4, Pages: 263-272, 2021, ISSN 1454-2331.
  5. Rotariu, A, Trana, E, **Matache, L**, Cirmaci-Matei, MV, Sandu, S, Moldoveanu, CE, Bucur, F, „*Experimental Study on the Dynamic Response of Polyurethane/fly Ash Ceramic Foam*”, Materiale Plastice, Volume 58 Issue 1, Pages: 106-112, 2021, DOI: 10.37358/MP.21.1.5450, ISSN 2668-8220, ISSN 0025-5289.
  6. Mircioaga, RM, **Matache, LC**, Rotariu, A, Cirmaci, M, Somoia, P, Haller, L Rancea, A, „*Burning law determination using numerical simulation of propellants burning in the closed vessel*”, IOP Conf. Series: Materials Science and Engineering Volume 916, Article number 012067, DOI: 10.1088/1757-899X/916/1/012067, ISSN 1757-8981.
  7. Bucur, F, Rotariu, A, **Matache, L**, Baci, F, Jiga, G, Trana, E, „*Experimental and Numerical Study on the Behavior of Dyneema (R) HB26 Composite in Compression*”, Materiale Plastice, Volume 58 Issue 1, Pages: 106-112, 2021, DOI: 10.37358/MP.21.1.5450, ISSN 2668-8220, ISSN 0025-5289.
  8. Rotariu AN, Bucur F, Cirmaci-Matei MV, **Matache LC** and E Trana, „*Development of the analytic relations for the propellant grain geometrical characteristics required for a maximum pressure plateau feature*”, Journal of Physics: Conference Series Volume 1507, Issue 27, Article number 022025, DOI: 10.1088/1742-6596/1507/2/022025 ISSN 17426588.
  9. Rotariu, AN, **Matache, L**; Bucur, F, Cirmaci-Matei, MV, Marmureanu, M, Trana, E, „*Implementation of a Gumbel distribution function in interior ballistic calculations for deterred propellants*”, UPB Scientific Bulletin, Series B: Chemistry and Materials Science Volume 82 Issue 1, Pages: 167-178, 2020, ISSN 1454-2331.
  10. Trana, E, Rotariu, AN, Rotariu, T, Pulpea, BG, Moldoveanu, CE, Bucur, F,

- Matache, LC**; Gozin, M, „*Experimental study on aluminum foils use in blast enhancement application*”, PROCEEDINGS OF THE ROMANIAN ACADEMY SERIES A-MATHEMATICS PHYSICS TECHNICAL SCIENCES INFORMATION SCIENCE Volume 20 Issue 3, Pages: 275-282, 2019, ISSN : 1454-9069.
11. Geanta, V, Voiculescu, I, Chereches, T, Zecheru, T, **Matache, L**, Rotariu, A, „*Behavior to Dynamic Loads of Multi-layer Composite Structures*”, Materiale Plastice, Volum 56 Issue 2, Pages: 460-465, 2019, ISSN 2668-8220, ISSN 0025-5289.
  12. **Matache, LC**, Chereches, T, Lixandru, P, Mazuru, A, Mitrica, D, Trana, E, Somoia, P, Rotariu, AN, „*Determination of a methodology for formulating constituent models of high entropy alloys*”, IOP Conf. Series: Materials Science and Engineering Volum 591, Articol număr 012058, DOI: 10.1088/1757-899X/591/1/012058, ISSN 1757-8981.
  13. **Matache, LC**, Lixandru, P, Chereches, T, Mazuru, A, Chereches, D, Geanta, V, Voiculescu, I, Trana, E, Rotariu, AN, „*Determination of material constants for high strain rate constitutive model of high entropy alloys*”, IOP Conf. Series: Materials Science and Engineering Volum 591, Articol număr 012057, DOI: 10.1088/1757-899X/591/1/012057, ISSN 1757-8981.
  14. Petre, R, Zecheru, T, Petrea, N, Ginghina, R, Sandu, S, Muresan, M, **Matache, LC**, Sava, AC, Neatu, F, „*Synthesis and Mechanical Properties of Polyurea-Based Hybrid Composites for Ballistic Individual Protection*”, Materiale Plastice, Volume 55 Issue 5, Pages: 315-319, 2018, ISSN 2668-8220, ISSN 0025-5289.
  15. Alil LC, Arrigoni M; Badea S; Ginghina R; **Matache LC**; Mostovykh P., „*Ballistic study of Tensylon (R)-based panels*”, EXPRESS POLYMER LETTERS Volume: 12 Issue: 6 Pages: 491-504 DOI:10.3144/expresspolymlett.2018.42, 2018, ISSN: 1788-618X.
  16. V. Geantă, I. Voiculescu, R. Ștefănoiu, T. Chereches, T. Zecheru, **L. Matache** and A. Rotariu, „*Dynamic Impact Behaviour of High Entropy Alloys Used in the Military Domain*”, IOP Conf. Series: Materials Science and Engineering Volume 374, Article number 012041, DOI: 10.1088/1757-899X/374/1/012041, ISSN 1757-8981.
  17. **Matache, LC**, Alil, LC, Rotariu, T, Sandu, SM, Puica, C, Barbu, C, Zecheru, T, „*Numerical validation of a constitutive model for UHMWPE-based composites at high strain rates*”, UPB Scientific Bulletin, Series B: Chemistry and Materials Science Volume 80 Issue 3, Pages: 229-246, 2018, ISSN 1454-2331.
  18. Geanta, V; Chereches, T; Lixandru, P.; Voiculescu, I.; Ștefănoiu, R.; Dragnea, D.; Zecheru, T.; **Matache, L.**, „*Virtual testing of composite structures made of high entropy alloys and steel*”, METALS Volume: 7 Issue: 11 Article Number: 496 DOI: 10.3390/met7110496, 2017, ISSN: 2075-4701
  19. Geanta, V; Chereches, T; Lixandru, P.; Voiculescu, I.; Ștefănoiu, R.; Dragnea, D.; Zecheru, T.; **Matache, L.**, „*Simulation of Impact Phenomena on the Composite Structures Containing Ceramic Plates and High Entropy Alloys*”, IOP Conference Series-Materials Science and Engineering Volume: 209, Article Number: 012043, DOI: 10.1088/1757-899X/209/1/012043, 2017, ISSN: 1757-8981.
  20. Rotariu Adrian, Trană Eugen, Dima Cornel, Enache Constantin, Timplaru Florin, **Matache Liviu**, „*Uninstrumented measurement method for granular porous media blast mitigation assessment*”, Experimental Techniques, ISSN 0732-8818 (Online ISSN: 1747-1567), vol.40, issue 3, pp. 993-1003, 2016, DOI 10.1007/s40799-016-0099-4.
  21. Trzcinski, Waldemar A., Cudzilo, Stanislaw, Paszula, Jozef, Eugen, Trana, Liviu, Matache, Traian, Rotariu, Gozin, Michael, „*Thermobaric effects formed by aluminium foils enveloping cylindrical charges*”, Combustion and Flame,

ISSN 0010-2180, vol. 166, pp 148-157, 2016, DOI 10.1016/j.combustflame.2016.01.010.

22. Eugen TRANĂ, Adrian-Nicolae Rotariu, Paul Lixandru, **Liviu-Cristian Matache**, Constantin Enache, Teodora Zecheru, „*Experimental and numerical investigation on 6082 0 temper aluminium alloy cartridge tubes drawing*”, Journal of Materials Processing Technology, ISSN 0924-0136, vol. 216, pp 59-70, 2015, DOI 10.1016/j.jmatprotec.2014.08.32
23. Alil, LC, **Matache, L**, Badea, SM, Ilie, F, „*Small scale test method to determine the capacity of the ballistic protection materials to mitigate the blast overpressure*”, Knowledge Based Organization International Conference, Volume 21, Pages: 764-769, 2015.
24. Zecheru T., Rotariu T., **Matache L.-C.**, Sava A.-C., Lungu R.-M., Voicu A., Coșoreanu L., „*Synthesis and applications of 3-nitro-1,2,4-triazol-5-one based hybrid energetic compositions*”, Revista de Chimie, 65 (10), pp. 1186-1189, 2014, ISSN: 0034-7752.
25. Țigănescu V., Rotariu T., Eșanu S.R., Zecheru T., Florea C., **Matache L.**, „*Studies regarding the effectiveness of stabilizer “revival” process on old propellants*”, Revista de Chimie, 65 (9), pp. 1042-1045, 2014.
26. Alil, LC, **Matache, LC**, Rogoz, A, Safta, I, „*Simulation model of a vertically launched body and the propelling gas dynamics*”, 18TH INTERNATIONAL CONFERENCE - THE KNOWLEDGE-BASED ORGANIZATION: APPLIED TECHNICAL SCIENCES AND ADVANCED MILITARY TECHNOLOGIES, CONFERENCE PROCEEDING 3, Pages: 9-14, 2012.
27. **Matache, L**, Rotariu, A, Paschia, L, Safta, I, „*A dimensional analysis of transducers mounts used in measurements of impulsive loads of structures*”, 17TH INTERNATIONAL CONFERENCE - THE KNOWLEDGE-BASED ORGANIZATION: APPLIED TECHNICAL SCIENCES AND ADVANCED MILITARY TECHNOLOGIES, CONFERENCE PROCEEDING 3, Pages: 110-114, 2011.
28. Timplaru, F, Rotariu, A, Trana, E, **Matache, L**, „*Experimental researches on attenuation properties of blast wave through perlite*”, 16TH INTERNATIONAL CONFERENCE THE KNOWLEDGE-BASED ORGANIZATION: APPLIED TECHNICAL SCIENCES AND ADVANCED MILITARY TECHNOLOGIES, CONFERENCE PROCEEDINGS 3, Pages: 336-340, 2010.
29. Rotariu, A, Trana, E, Timplaru, F, **Matache, L**, Badea, S, Chereches, T, „*On attenuation properties of blast wave through perlite*”, MODTECH 2010: NEW FACE OF TMCR, PROCEEDINGS, Pages: 499-452, 2010.
30. **Matache L.**, Zecheru T., Iorga O., Enache Constantin, Șomoiaș P., „*Laboratory Scale Synthesis of Keto-RDX*”, MTA Review, vol. XXV, no. 2, Iunie 2015, ISSN: 1843-3391
31. **Liviu Matache**, Adrian Rotariu, Teodora Zecheru, Tudor-Viorel Țigănescu, Traian Rotariu, Constantin Enache, „*A solution for the interior ballistics fundamental problem of weapon systems equipped with new energetic materials*”, MTA Review, Vol. XXV, No. 3, Sep. 2015, ISSN: 1843-3391.
32. **Liviu Matache**, Constantin Puica, Adrian Rotariu, Eugen Trana, Florina Bucur, „*Numerical simulation of military ground vehicle's response to mine-blast load*”, UPB Scientific Bulletin, Series D: Mechanical Engineering Volume 80, Issue 4, 2018, ISSN 1454-2358.
33. Bogdan Pulpea, Andreea-Elena Voicu, **Liviu Matache**, Laviniu Haller, Andrei Mandache-Dodoiu, Raluca Ginghina *Numerical Simulation of Interior Ballistics for Pyrotechnics Systems*, MTA Review, Vol. XXVII, No. 1, Jun. 2017.
34. **L.-C. Matache**, T. Zecheru, A. Rotariu, T. Cherecheș, *Experimental determination of blast waves parameters generated by firing of large-caliber gun systems*, International Journal of Modern Manufacturing Technologies II (1), 49-54, 2010.

35. M. Bugaru, T. Cherecheș, **L. Matache**, A. Sava, T. Zecheru, *Dynamic Behavior of Helical Gear-Pair Systems with Backlash and Periodic Variation of Mesh Stiffness and Mesh Damping, Part I: Computation of Amplitude and Phase Angle*, Machine – Building and Technosphere of the XXI Century, 2008, Sevastopol, Ucraina..

**Books**

1. **L.C. Matache**, A.N. Rotariu, T. Homutescu, F. Dîrloman, Simularea numerică în rezolvarea problemelor de balistică interioară, 2023, ISBN 978-973-640-339-2, 171 p.
2. **L.C. Matache**, A.N. Rotariu, Simularea numerica a fenomenelor dinamice cu viteze mari de deformare. Aplicatii de balistica terminală, 2021, ISBN 978-973-640-328-6, 138p.
3. A.N. Rotariu, **L.C. Matache**, Metode de calcul în balistica interioară. București, Editura Academiei Tehnice Militare, 2015, ISBN 978-973-640-241-8. 160 p.
4. G.B. Pulpea, D. Pulpea, **L.C. Matache**, Sisteme pirotehnice de mascare, 2019, ISBN 978-973-640-297-5.
5. M.V. Cîrmaci, **L.C. Matache**, Proiectarea sistemelor de armament: aplicații în balistica interioară și tranzițională. București, Editura Academiei Tehnice Militare, 2010, ISBN 978-973-640-192-3.

**2023 HABILITATION THESIS**

Military Technical Academy, Bucharest (Romania)

Numerical simulation research of internal ballistics and terminal ballistics phenomena involving high-speed dynamic transformations

**Other competences**

1. Scientific applications: AutoCad, MathCad, Matlab, Fluent, LS-Dyna, SolidWorks;
2. Software: Visual Basic, C#, Visual C++

**Experience in national/  
international projects**

<b>Program/Project</b>	<b>Period</b>
Metode inverse de calcul în balistica interioară și îmbunătățirea metodelor numerice existente (RECBALL)	2023 – 2026
Lovitură reactivă în tandem EFP/TB pentru lansatoare portative	2022 – 2024
Combustibil compozit cu impact redus asupra mediului pentru sisteme propulsive nedorizate	2022 – 2024
Încărcături de pulbere de azvârlire/propergol solid de mare energie obținute prin fabricație aditivă	2022 – 2024
Simulator complex pentru dezvoltarea, testarea și validarea metodelor și mijloacelor de reacție, specifice forțelor de intervenție, în cazul amenințărilor și riscurilor asimetrice care se produc în zone urbane	2021 – 2023
Blindaj suplimentar multistrat cu plăci groase perforate oblic destinat contracarării amenințărilor cinetice de calibr mic	2020 – 2022
Casti de protecție echipate cu componente de amortizare din materiale poroase imbibate cu nanofluid	2020 – 2022
Sisteme de distrugere cu explozivi pentru neutralizarea sub apă a dispozitivelor explozive	2019 – 2022
Concept de componentă de luptă exploziv-fugasă cu efect	2017 – 2018

crescut (BEHEWC)	
Sistem cumulativ diedric flexibil pentru tăierea sub apă a structurilor metalice (FlexMetCut)	2017 – 2018
Sistem de protecție împotriva exploziei, agenților chimici și biologici, destinat echipării clădirilor (DOORANTIEX)	2016 – 2018
Lovitură termobarică pentru aruncătorul de proiectile reactive nedirijate cal. 122 mm	2015 – 2018
<b>Program/Project</b>	<b>Period</b>
„Studii doctorale și postdoctorale Orizont 2020: promovarea interesului național prin excelență, competitivitate și responsabilitate în cercetarea științifică fundamentală și aplicată românească” - Contract POSDRU/159/1.5/S/140106 – 2014-2015 – postdoctorand	2015-2016
Explosion protection system to equip vehicles (CREWPROTECT)	2014 – 2017
Structuri compozite modulare pentru protecția împotriva efectelor complexe ale dispozitivelor explozive improvizate (IEDPROTECT)	2014 – 2017
Structuri compozite hibride simulatoare de corp uman utilizate pentru evaluarea impactului dinamic în medii cu potențial de risc ridicat (HYBRIDSIM)	2014 – 2017
Complet de neutralizare a munițiilor nefuncționate	2014 – 2015
Thermobaric rocket for RPG-7	2014 – 2015
Composite structures resistant at dynamic loadings applied with high deformation speeds used in the field of collective protection (HEAMIL)	2012-2015
Explosive device for breaching operation	2010 – 2014
Contract nr. 071/2001 in the frame of MENER programme	2002-2004
Contract nr. 1635/2002 in the frame of RELANSIN programme	2002-2005
Contract nr. 1777/2003 in the frame of RELANSIN programme	2003-2005
Contract nr. 21R/2005 in the frame of SECURITATE programme	2005
Contract nr. 13/2006 in the frame of CEEEX programme	2006-2008
Contract nr. 21/2006 in the frame of CEEEX programme	2006-2008
Contract nr. 118/2006 in the frame of CEEEX programme	2006-2008
Contract nr. 46/2007 in the frame of CEEEX programme	2007-2009
NATO Sfp-982063 „Management of Security Related R&D in Support of Defence Industrial Transformation”	2007-2009
Intelligent infantry munition	2005
Hand-held antitank rocket system	2006
Video-output night aiming modular device	2007
Modern method of approaching firing tables	2007
Lighting firings cal. 81 mm and 120 mm with electronic fuses FET-1	2008