

CURRICULUM VITAE *

Dr. Andrey A. Krasovskii
Research Scholar
Ecosystems Services & Management Program
International Institute for Applied Systems Analysis
Schlossplatz 1, A-2361 Laxenburg, Austria



Date of Birth: November 15, 1981
Marital Status: Married
Nationality: Russian

☎ +43-2236-807-390

Web: <http://www.iiasa.ac.at/staff/krasovskii>

1 About A. Krasovskii

Dr. Andrey Krasovskii is a Research Scholar in the Ecosystems Services and Management Program at the International Institute for Applied Systems Analysis. His expertise is mathematical modeling, simulations, control problems and optimization, with applications in ecosystems, economics, technology, and social sciences. His research experience includes modeling burned areas in Europe and Indonesia, as well as adaptation options under climate change, dynamic optimization in models of economic growth and R&D investments, optimization of election policies in age-structured societies, modeling evaluation of REDD-based offsets with benefit-sharing mechanism.

More information about the wildfire climate impacts and adaptation model (FLAM) is available online: <http://www.iiasa.ac.at/FLAM>

2 Education

- | | |
|-------------------|---|
| 05/2008 | Ph.D. defense on specialty mathematical modeling, numerical methods, and program complexes at the Ural State University (USU), Ekaterinburg, Russia
Degree of the Candidate of Physical and Mathematical Sciences |
| 06/2005 – 05/2008 | Ph.D. student at the Institute of Mathematics and Mechanics (IMM), Ural Branch of the Russian Academy of Sciences, Ekaterinburg, Russia
Thesis title: “Methods for Solving Optimal Control Problems with Infinite Horizon”
Supervisor: Prof. Alexander M. Tarasyev |
| 06/2006 – 08/2006 | Young Scientists Summer Program (YSSP)
International Institute for Applied Systems Analysis (IIASA), Laxenburg, Austria
Project title: “Assessment of the Impact of Aggregated Economic Factors on Optimal Consumption in Models of Economic Growth”
Supervisors: Professors Robert U. Ayres and Alexander M. Tarasyev |
| 06/1999 – 06/2005 | Master’s Degree in Applied Mathematics and Physics from the Ural State Technical University (USTU-UPI), Ekaterinburg, Russia
Department of Physics and Technology, Chair of Theoretical Physics
Thesis topic: “Dynamic optimization in models of business planning”
Supervisor: Prof. Alexander M. Tarasyev |
| 06/1989 – 06/1999 | School Certificate in Linguistics Gymnasium No. 13, Ekaterinburg, Russia
Class of Physics and Mathematics |

*Last updated on March 11, 2019

3 Professional experience

02/2012 – present time	Research Scholar at IIASA Ecosystems Services & Management (ESM) Program
12/2011 – 12/2012	Research Scholar at IIASA Advanced Systems Analysis (ASA) Program
10/2008 – 01/2012	Research Scholar at IMM Dynamic Systems Department
02/2009 – 05/2010	Junior Researcher at Vienna Institute of Demography (VID) Austrian Academy of Sciences (ÖAW), Vienna, Austria Population Economics Group
03/2008 – 01/2009	Research Assistant at IIASA’s Dynamic Systems Program (DYN)
06/2005 – 10/2008	Research Assistant at IMM
07/2007 – 10/2007	Research Assistant (Mikhalevich Award) at IIASA

4 Fee contracts

09/2011 - 11/2011	Development of the software “STARK Pilot – Toolbox for Analysis of Economic Growth” Supervisor: Prof. Arkady Kryazhimski, IIASA
04/2011 - 07/2011	Research on optimal control in age-distributed dynamical systems with fixed size. Project No. P20408-G14 of the Austrian Science Fund (FWF). Supervisor: Prof. Gustav Feichtinger, TU Wien.

5 Consultancy

10/2013 - 10/2014	EU-tender “Development of an analytical tool for long-term (2050+) projections and analysis of various scenarios related to food security, climate change, etc. Case-study 2050”. Contract No. 153731-2013-A08-DE between IAMO and the European Commission, JRC/IPTS. Sub-contractor of the Leibniz Institute for Agricultural Development in Central and Eastern Europe, Halle, Germany.
05/2012 - 10/2012	Statistical consultancy for the General Electric (GE) project on data quality. Application of methods for outlier detection. Exadel, Inc., Walnut Creek, CA, USA
03/2012 - 05/2012	Reviewer of various dynamic modeling approaches (including their specifications and estimations) enabling an analysis of long-term policy impacts in the framework of the “Methodological requirements of a modeling tool for simulation of long-term (2050) effects of policies affecting the agricultural and food sectors project” as a part of the ENgAGE consortium agreement between the LEI and the EU Commission.
09/2010 - 11/2010	Elaboration of the model for analysis of the US regional advertising auctions for the ABC company using R (Chaw’s test, Principle component analysis, Multiple regressions, k-nearest neighbor method) 741 Studios LLC., San Francisco, USA

6 Teaching and supervision

Summer 2018	Co-supervision (with Prof. Stephan Pietsch) of the IIASA-YSSP student Camila Thiemy Dias Numazawa Project title: “Multiple benefits from advanced forest management in the Brazilian Amazon: the coupled BGC-MAN/G4M approach”
Summer 2017	Supervision of the IIASA-YSSP student Hadi Project title: “Three decades of forest cover changes in the humid tropical Indonesia: detection and verification at high resolution”
2013 - 2014	Associate lecturer at Vienna University of Economics and Business (WU Wien) Winter term 2013/2014: Course #1880 – Applied Microeconomics Summer term 2013: Course #5939 – Applied Microeconomics Language: English; Class size: 40 students
2005 - 2008	Assistant lecturer at the Ural State Technical University, Ekaterinburg, Russia Courses on probability theory and statistics, control, mathematical modeling

7 Editorial Duties and Society Fellows

2008 – present time	Technical Committee 2.4 on Optimal Control of the International Federation of Automatic Control (IFAC)
2018	European Geosciences Union (EGU)
2019 – present time	Review Editor on the Editorial Board of Negative Emission Technologies, part of the journal <i>Frontiers in Climate</i>

8 Honors and distinctions

2008	Award of the Governor of the Sverdlovsk Region for Young Scientists for the study in the field of Telecommunications and Control Systems
2007 – 2008	The “Best postgraduate students of the Russian Academy of Sciences” Award of the Fund of the National Science Support
2006	IIASA’s Mikhalevich Award

9 Research interests

- Mathematical modeling and simulations
- Control and optimization
- Data analysis
- Applications in economics, ecosystems, and technology
- Software and modeling tools design

10 Language skills

English: fluent; German: ÖSD Zertifikat Deutsch Österreich B1, ÖIF Integrationsprüfung: Sprachkompetenz (Niveau: B1), Werte- und Orientierungswissen; Russian: native language.

11 Technical skills

Operating system (OS)	Windows, Ubuntu
Statistics software	R, SPSS, Excel
Mathematical modeling software	Matlab, Maple, MathCad, Mathematica, Vensim, Scientific WorkPlace, Dynare
Programming languages	Pascal, Delphi, C, Python, Java, NetBeans, PHP, VBA
Geographic information system	QGIS, GRASS GIS, SAGA GIS
Text editing and graphics software	L ^A T _E X, MS Office, LibreOffice, HTML, CSS, Visio, Adobe Illustrator, Photoshop, InDesign, GIMP, Inkscape, Beamer, Prezi
Database management systems	MySQL
Content management systems	Joomla, WordPress
Other	Excel ↔ VBA ↔ GAMS interface design

12 Other skills

- Music: guitar, bass, keyboards, and recording
- Sports: gym, athletics, candidate master in chess

13 Hobbies

- Classical music
- Poetry
- Chess

14 Selected publications

Journal papers:	[1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23]
Conference papers:	[24, 25, 26, 27, 28]
Book chapters:	[29, 30, 31]
Technical reports & working papers:	[32, 33, 34, 35, 36, 37, 38]

15 Selected presentations

15.1 Talks and Lectures

- Krasovskii A, Modeling wildfire dynamics: the FLAM approach // Side event on forest fires at the French Pavilion, organized by the French Ministry of Agriculture and Food, UN Climate Change Conference 2018 (COP24), 8 December 2018, Katowice, Poland.
- Krasovskii A, Shvidenko A, Khabarov N, Schepaschenko D, Kraxner F, Wildfire dynamics in Russia: the FLAM model approach // IBFRA 2018, Cool forests at risk? The critical role of boreal and mountain ecosystems for people, bioeconomy, and climate. 17-20 September 2018, IIASA, Laxenburg, Austria
- Krasovskii A, Modelling Forest Fire in Indonesia // Forest Fires Global Expert Workshop, 2-4 July 2018, Vienna, Austria.
- Krasovskii A, Khabarov N, Kraxner F, Yowargana P, Pirker J, Pietsch S, Shchepashchenko D, and Obersteiner M, Modeling spatial and temporal patterns of wildfires in Indonesia with the

FLAM model //EGU General Assembly 2018, 8–13 April 2018, Vienna, Austria.
<https://meetingorganizer.copernicus.org/EGU2018/EGU2018-12406.pdf>

- Krasovskii A, Platov A, Modeling optimal forest management and associated risks // IUFRO 125th Anniversary Congress, 18–22 September 2017, Freiburg, Germany
- Krasovskii A, Khabarov N, Kraxner F et al, Modeling wildfires in Indonesia with the FLAM model // IUFRO 125th Anniversary Congress, 18–22 September 2017, Freiburg, Germany
- Krasovskii A, Optimal Control Component // Workshop on “Long-term Modelling in Agricultural Sector”, JRC-IPTS, Seville, Spain, October 14, 2014.
- Krasovskii AA, Khabarov NV, Reuter WH, Obersteiner M, An optimization model linking electricity prices, CO₂ prices, and REDD+ options // International Conference “Systems Dynamics and Control Processes”, Ekaterinburg, Russia, September 15-20, 2014.
- Migliavacca M, Khabarov N, Krasovskii A, and Dosio A, Forest Fires and Adaptation Options in Europe // European Climate Change Adaptation Conference (ECCA), Hamburg, Germany, March 18-20, 2013.
- Krasovskii AA, Pisarenko DA, PrimCity: Policy Development Kit // Workshop on Economic Growth Research within the IIASA Network: an Overview, IIASA, Laxenburg, December 7-8, 2012.
- Krasovskii AA, Application of Optimal Control to Analysis of Long-Term Policy Impacts // Interim Technical Meeting Development of a Modelling Tool for Simulation of Long-Term (2050) Effects of Agricultural, Trade and Structural Policies, Institute for Prospective Technological Studies, European Commission, Joint Research Centre, Seville, Spain, April 11-12, 2012.
- Krasovskii AA, STARK Pilot Toolbox for Analysis of Economic Growth // Green Growth and Sustainable Development Symposium, IIASA, Laxenburg, Austria, 2011.
- Krasovskii AA, Optimal Age-Specific Election Policies in Two-Level Organizations with Fixed Size // VID Colloquium, Vienna Institute of Demography, Austrian Academy of Sciences, 2009.
- Krasovskii AA, Sequential Learning in Economic Growth Modeling // IIASA-TokyoTech Workshop on Hybrid Management of Technology in the 21st Century, International Institute for Applied Systems Analysis, Laxenburg, 2008.
- Krasovskii AA, Synthetic Optimal Trajectories in Economic Growth Modeling // Seminar of the Austrian Institute of Economic Research, WIFO, 2008.
- Krasovskii A, Algorithms for Constructing Optimal Control in Nonlinear Problems with Infinite Horizon // World Congress of Nonlinear Analysts, WCNA’2008, Orlando FL, USA, 2008.
- Krasovskii AA, Tarasyev AM, Modeling of Optimal Trends for Dynamic Systems on Infinite Horizon // 22nd European Conference on Operational Research EURO’XXII, University of Economics, Prague, 2007.
- Krasovskii, A.A., Tarasyev AM, Problems of Optimal Timing Control // 11th IFAC Symposium “Computational Economics & Financial and Industrial Systems” CEFIS’2007, Dogus University of Istanbul, 2007.

15.2 Multimedia exhibit

- Krasovskii A, Khabarov N, & Obersteiner M. Fair pricing of REDD-based emission offsets under risk preferences and benefit-sharing. In: IIASA Institutional Evaluation 2017, 27 February-1 March 2017, IIASA, Laxenburg, Austria. <http://pure.iiasa.ac.at/14457/>
- Krasovskii AA, STARK Pilot – Software for Analysis of Economic Growth // IIASA 40th Anniversary Conference, Vienna, Austria, October 24-26, 2012.

15.3 Posters

- Hadi, Krasovskii A, Maus V, Yowargana P, Pietsch S, and Rautiainen M, The potential of Landsat time series to characterize historical dynamic and monitor future disturbances in human-modified rainforests of Indonesia // EGU General Assembly 2018, Vienna, Austria, 8–13 April 2018. <https://meetingorganizer.copernicus.org/EGU2018/EGU2018-13826.pdf>
- Khabarov N, Krasovskii A, Obersteiner M, Swart R, Dosio A, San-Miguel-Ayanz J, Durrant T, Camia A, et al., Adaptation to Increasing Risk of Forest Fires // IIASA Institutional Evaluation 2017, 27 February-1 March 2017, IIASA, Laxenburg, Austria. <http://pure.iiasa.ac.at/14456/>
- Krasovskii A, Khabarov N, Obersteiner M, REDD-based offsets: Benefit sharing and risks // Systems Analysis 2015: A conference in celebration of Howard Raiffa, IIASA, Laxenburg, Austria, November 11-13, 2015.
- Krasovskii A, Khabarov N, Obersteiner M, Discount Options as a Financial Instrument Supporting REDD+ // IUFRO XXIV World Congress, Salt Lake City, USA, October 5-11, 2014. Published in [39].
- Krasovskii AA, Tarasyev AM, Dynamics of Optimal Growth: Economic Drivers and Long-Term Scenarios // IIASA 40th Anniversary Conference, Vienna, Austria, October 24-26, 2012.

References

- [1] A. Krasovskii, N. Khabarov, J. Pirker, F. Kraxner, P. Yowargana, D. Schepaschenko, and M. Obersteiner, “Modeling burned areas in Indonesia: The FLAM approach,” *Forests*, vol. 9, no. 7, 2018.
- [2] Hadi, A. Krasovskii, V. Maus, P. Yowargana, S. Pietsch, and M. Rautiainen, “Monitoring deforestation in rainforests using satellite data: A pilot study from Kalimantan, Indonesia,” *Forests*, vol. 9, no. 7, 2018.
- [3] A. A. Golub, S. Fuss, R. Lubowski, J. Hiller, N. Khabarov, N. Koch, A. Krasovskii, F. Kraxner, T. Laing, M. Obersteiner, C. Palmer, P. Piris-Cabezas, W. H. Reuter, J. Szolgayov, L. Taschini, and J. Wehkamp, “Escaping the climate policy uncertainty trap: options contracts for REDD+,” *Climate Policy*, pp. 1–8, 2018.
- [4] A. A. Krasovskii, P. D. Lebedev, and A. M. Tarasyev, “Some facts about the Ramsey model,” *Proceedings of the Steklov Institute of Mathematics*, vol. 299, pp. 123–131, Dec 2017.
- [5] A. Krasovskii, N. Khabarov, and M. Obersteiner, “CO₂-intensive power generation and REDD-based emission offsets with a benefit-sharing mechanism,” *Energy Systems*, vol. 8, no. 4, pp. 857–883, 2017.
- [6] A. A. Krasovskii, P. D. Lebedev, and A. M. Tarasyev, “Bernoulli substitution in the Ramsey model: Optimal trajectories under control constraints,” *Computational Mathematics and Mathematical Physics*, vol. 57, pp. 770–783, May 2017.
- [7] A. A. Krasovskii and A. S. Platov, “Bilinear optimal control problem of a discrete logging,” *Trudy Instituta Matematiki i Mekhaniki UrO RAN*, vol. 23, no. 1, pp. 188–194, 2017.
- [8] A. Krasovskii, N. Khabarov, and M. Obersteiner, “Fair pricing of REDD-based emission offsets under risk preferences and benefit-sharing,” *Energy Policy*, vol. 96, pp. 193–205, 2016.
- [9] A. Krasovskii, N. Khabarov, M. Migliavacca, F. Kraxner, and M. Obersteiner, “Regional aspects of modelling burned areas in Europe,” *International Journal of Wildland Fire*, vol. 25, no. 8, pp. 811–818, 2016.

- [10] N. Khabarov, A. Krasovskii, M. Obersteiner, R. Swart, A. Dosio, J. San-Miguel-Ayanz, T. Durrant, A. Camia, and M. Migliavacca, “Forest fires and adaptation options in Europe,” *Regional Environmental Change*, vol. 16, no. 1, pp. 21–30, 2016.
- [11] A. Krasovskii, P. Lebedev, and A. Tarasyev, “Some facts about the Ramsey mode (in Russian),” *Proceedings of Institute of Mathematics and Mechanics*, pp. 160–168.
- [12] A. A. Krasovskii, “Application of optimal control to a biomechanics model,” *Proceedings of the Steklov Institute of Mathematics*, vol. 291, no. 1, pp. 118–126, 2015.
- [13] A. A. Krasovskii, N. V. Khabarov, and M. Obersteiner, “Impacts of the fairly priced REDD-based CO₂ offset options on the electricity producers and consumers,” *Economy of Region*, no. 3, pp. 273–288, 2014.
- [14] M. Migliavacca, A. Dosio, A. Camia, R. Houbourg, T. Houston-Durrant, J. W. Kaiser, N. Khabarov, A. A. Krasovskii, B. Marcolla, S. Miguel-Ayanz, *et al.*, “Modeling biomass burning and related carbon emissions during the 21st century in Europe,” *Journal of Geophysical Research: Biogeosciences*, vol. 118, no. 4, pp. 1732–1747, 2013.
- [15] M. Migliavacca, A. Dosio, S. Kloster, D. Ward, A. Camia, R. Houbourg, T. Houston Durrant, N. Khabarov, A. Krasovskii, S. Miguel-Ayanz, *et al.*, “Modeling burned area in Europe with the Community Land Model,” *Journal of Geophysical Research: Biogeosciences*, vol. 118, no. 1, pp. 265–279, 2013.
- [16] G. Feichtinger, A. A. Krasovskii, A. Prskawetz, and V. M. Veliov, “Optimal age-specific election policies in two-level organizations with fixed size,” *Central European Journal of Operations Research*, vol. 20, no. 4, pp. 649–677, 2012.
- [17] A. A. Krasovskii and A. N. Krasovskii, “Nonlinear positional differential game in the class of mixed strategies,” *Proceedings of the Steklov Institute of Mathematics*, vol. 277, no. 1, pp. 137–143, 2012.
- [18] A. A. Krasovskii, A. M. Tarasyev, and C. Watanabe, “Optimization of functionality development,” *Applied Mathematics and Computation*, vol. 217, no. 3, pp. 1125–1134, 2010.
- [19] A. Krasovskii and A. Taras’ev, “Construction of nonlinear regulators in economic growth models,” *Proceedings of the Steklov Institute of Mathematics*, vol. 268, no. 1, pp. 143–154, 2010.
- [20] A. A. Krasovskii, I. V. Matrosov, and A. M. Tarasyev, “Optimal timing control in game modeling of an energy project infrastructure,” *Nonlinear Analysis: Theory, Methods & Applications*, vol. 71, no. 12, pp. e2498–e2506, 2009.
- [21] A. A. Krasovskii and A. M. Tarasyev, “Properties of Hamiltonian systems in the Pontryagin maximum principle for economic growth problems,” *Proceedings of the Steklov Institute of Mathematics*, vol. 262, no. 1, pp. 121–138, 2008.
- [22] A. A. Krasovskii and A. M. Tarasyev, “An algorithm for construction of optimal timing solutions in problems with a stochastic payoff function,” *Applied Mathematics and Computation*, vol. 204, no. 2, pp. 632–643, 2008.
- [23] A. A. Krasovskii and A. Taras’ev, “Dynamic optimization of investments in the economic growth models,” *Automation and remote control*, vol. 68, no. 10, pp. 1765–1777, 2007.
- [24] A. A. Krasovskii, P. D. Lebedev, and A. M. Tarasyev, “Application of optimal control and stabilization to an infinite time horizon problem under constraints **the research was supported by the russian science foundation (project no. 15-11-10018).,” *IFAC-PapersOnLine*, vol. 50, no. 1, pp. 4057 – 4062, 2017.

- [25] R. U. Ayres, A. A. Krasovskii, and A. M. Tarasyev, “Nonlinear stabilizers of economic growth under exhausting energy resources,” in *Control Applications of Optimization*, vol. 7 of *IFAC Proceedings Volumes (IFAC-PapersOnline)*, pp. 251–256, 2009.
- [26] A. A. Krasovskii and A. M. Tarasyev, “High-precision algorithms for constructing optimal trajectories via solving Hamiltonian systems,” in *Control Applications of Optimization*, vol. 7 of *IFAC Proceedings Volumes (IFAC-PapersOnline)*, pp. 70–75, 2009.
- [27] A. Krasovskii and A. Tarasyev, “Conjugation of Hamiltonian systems in optimal control problems,” in *World Congress*, vol. 17 of *IFAC Proceedings Volumes (IFAC-PapersOnline)*, pp. 7784–7789, 2008.
- [28] A. Krasovskii, N. Khabarov, and M. Obersteiner, “Modeling financial instruments supporting REDD,” in *System Dynamics and Control Processes – SDCP’2014* (V. Maksimov and T. Filipova, eds.), pp. 42–49, 2015.
- [29] N. Khabarov, A. Krasovskii, A. Schwartz, I. McCallum, and M. Obersteiner, “Socioeconomic value of hydrometeorological information in Austria,” in *GEOvalue: The Socioeconomic Value of Geospatial Information*, pp. 283–296, CRC Press, 2018.
- [30] A. A. Krasovskii and A. M. Tarasyev, “Sequential precision of predictions in models of economic growth,” in *Dynamic Systems, Economic Growth, and the Environment*, pp. 23–43, Springer, 2010.
- [31] A. A. Krasovskii and A. M. Tarasyev, “High order precision estimates in algorithms for solving problems of economic growth,” in *Dynamic Systems, Economic Growth, and the Environment*, pp. 45–59, Springer, 2010.
- [32] A. Krasovskii, “Assessment of the impact of aggregated economic factors on optimal consumption in models of economic growth,” Tech. Rep. IR-06-050, IIASA Working Paper, 2006.
- [33] A. Krasovskii and N. Khabarov, “Opportunity costs and offsets acceptance in FI-REDD model,” Tech. Rep. WP-17-019, IIASA Working Paper, 2017.
- [34] A. Krasovskii, N. Khabarov, and M. Obersteiner, “Fair pricing of REDD-based emission offsets under risk preferences and benefit sharing,” Tech. Rep. IR-15-019, IIASA Interim Report, 2015.
- [35] A. Krasovskii, N. Khabarov, and M. Obersteiner, “CO₂-intensive power generation and REDD-based emission offsets with a benefit sharing mechanism,” Tech. Rep. IR-15-018, IIASA Interim Report, 2015.
- [36] A. Krasovskii, A. Tarasyev, and C. Watanabe, “Assessment of the market development trajectory for optimal timing of technological innovation,” Tech. Rep. IR-08-007, IIASA Interim Report, 2008.
- [37] M. Bukowski, P. Conforti, P. Dixon, A. Gohin, A. Krasovskii, *et al.*, “Simulating long-term effects of policies in the agri-food sector: requirements, challenges and recommendations,” in *Scientific and Policy Report by the Joint Research Centre of the European Commission* (A. Tonini, J. Michalek, T. Fellmann, R. Mbarek, J. Delincé, and G. Philippidis, eds.), Publications Office of the European Union, 2013.
- [38] K. Williges, R. Mechler, S. Werners, A. Krasovskii, A. Dosio, N. Khabarov, E. Terama, and G. Trombi, “Improved methods and metrics for assessing impacts, vulnerability and adaptation,” Tech. Rep. Deliverable 2.4, FP7 MEDIATION Project, 2013.
- [39] A. Krasovskii, N. Khabarov, and M. Obersteiner, “Discount options as a financial instrument supporting REDD (plus),” in *XXIV IUFRO World Congress, “Sustaining Forests, Sustaining People: The Role of Research”*, vol. 16 of *International Forestry Review*, (Salt Lake City, USA), p. 541, 2014.