Viktor Senderov

CV Supplement 1—Summary of Scientific Achievements

Complete list of publications

Doctoral Thesis and associated papers

[1] **Viktor Senderov**. *The Open Biodiversity Knowledge Management System in Scholarly Publishing*. PhD thesis, Bulgarian Academy of Sciences, 06 2019. doi:10.13140/RG.2.2.34687.18081.

[2] **Viktor Senderov**, Kiril Simov, Nico Franz, Pavel Stoev, Terry Catapano, Donat Agosti, Guido Sautter, Robert A Morris, and Lyubomir Penev. OpenBiodiv-O: ontology of the OpenBiodiv knowledge management system. *Journal of biomedical semantics*, 9:1–15, 2018. URL: https://jbiomedsem.biomedcentral.com/articles/10.1186/s13326-017-0174-5.

[3] **Viktor Senderov** and Lyubomir Penev. The open biodiversity knowledge management system in scholarly publishing. *Research Ideas and Outcomes*, 2:e7757, 2016. URL: https://riojournal.com/article/7757/.

[4] **Viktor Senderov**, Teodor Georgiev, and Lyubomir Penev. Online direct import of specimen records into manuscripts and automatic creation of data papers from biological databases. *Research Ideas and Outcomes*, 2, 2016. URL: https://riojournal.com/article/10617/.

[5] Mariya Dimitrova, **Viktor E Senderov**, Teodor Georgiev, Georgi Zhelezov, and Lyubomir Penev. Infrastructure and Population of the OpenBiodiv Biodiversity Knowledge Graph. *Biodiversity Data Journal*, 9, 2021. URL: https://bdj.pensoft.net/article/67671/instance/6820326/.

Articles in preparation

[6] **Viktor Senderov**, Jan Kudlicka, Nicolas Lartillot, Jérémy Andréoletti, Emma Granqvist, Ignacio Quintero, Hélène Morlon, David Broman, and Fredrik Ronquist. Trait evolution, not speciation, drives gradual diversification rate changes in birds. This article is targeting Nature Ecology and Evolution.

Other published or submitted research articles

[7] Gizem Caylak, Daniel Lundén, **Viktor Senderov**, and David Broman. Statically and dynamically delayed sampling for typed probabilistic programming languages. In *Proceedings of the 17th ACM SIGPLAN International Conference on Software Language Engineering*, SLE '24, page 157–170, New York, NY, USA, 2024. Association for Computing Machinery. doi:10.1145/3687997.3695634.

[8] Hélène Morlon, Jérémy Andréoletti, Joëlle Barido-Sottani, Sophia Lambert, Benoît Perez-Lamarque, Ignacio Quintero, **Viktor Senderov**, and Pierre Veron. Phylogenetic insights into diversification. *Annual Review of Ecology, Evolution, and Systematics*, 55, 2024.

[9] **Viktor Senderov**, Jan Kudlicka, Daniel Lunden, Viktor Palmkvist, Mariana P Braga, Emma Granqvist, David Broman, and Fredrik E Ronquist. Treeppl: A universal

probabilistic programming language for phylogenetics. *bioRxiv*, 2023. doi:10.1101/2023.10.10.561673.

[10] **Viktor Senderov**, Fredrik Ronquist, Jan Kudlicka, Johannes Borgström, Nicolas Lartillot, Daniel Lundén, Lawrence Murray, Thomas B Schön, and David Broman. Universal probabilistic programming offers a powerful approach to statistical phylogenetics. *Communications biology*, 4(1):244, 2021. URL: https://www.nature.com/articles/s42003-021-01753-7.

[11] Daniel Lundén, Joey Öhman, Jan Kudlicka, **Viktor Senderov**, Fredrik Ronquist, and David Broman. Compiling universal probabilistic programming languages with efficient parallel sequential monte carlo inference. In *ESOP*, pages 29–56, 2022. URL: https://link.springer.com/chapter/10.1007/978-3-030-99336-8_2.

[12] Pedro Cardoso, Pavel Stoev, Teodor Georgiev, **Viktor Senderov**, and Lyubomir Penev. Species Conservation Profiles compliant with the IUCN Red List of Threatened Species. *Biodiversity Data Journal*, 4, 2016. URL: https://bdj.pensoft.net/article/10356/.

[13] Lyubomir Penev, Mariya Dimitrova, **Viktor Senderov**, Georgi Zhelezov, Teodor Georgiev, Pavel Stoev, and Kiril Simov. OpenBiodiv: a knowledge graph for literature-extracted linked open data in biodiversity science. *Publications*, 7(2):38, 2019.

[14] Mariya Dimitrova, **Viktor Senderov**, Kiril Simov, Teodor Georgiev, and Lyubomir Penev. OpenBiodiv-O Ontology: Bridging the Gap Between Biodiversity Data and Biodiversity Publishing. *Biodiversity Information Science and Standards*, (7656), 2019.

[15] Lyubomir Penev, Teodor Georgiev, **Viktor Senderov**, Mariya Dimitrova, and Pavel Stoev. The Pensoft data publishing workflow: The FAIRway from articles to Linked Open Data. *Biodiversity Information Science and Standards*, 3:e35902, 2019.

[16] Mariya Dimitrova, **Viktor Senderov**, Teodor Georgiev, Georgi Zhelezov, and Lyubomir Penev. OpenBiodiv: Linking type materials, institutions, locations and taxonomic names extracted from scholarly literature. *Biodiversity Information Science and Standards*, 3:e35089, 2019.

[17] Lyubomir Penev, Daniel Mietchen, Vishwas Chavan, Gregor Hagedorn, Vincent Smith, David Shotton, Éamonn Ó Tuama, **Viktor Senderov**, Teodor Georgiev, Pavel Stoev, et al. Strategies and guidelines for scholarly publishing of biodiversity data. *Research Ideas and Outcomes*, 3:e12431, 2017. URL: https://riojournal.com/article/12431/.

[18] Lyubomir Penev, Teodor Georgiev, Peter Geshev, Seyhan Demirov, **Viktor Senderov**, Iliyana Kuzmova, Iva Kostadinova, Slavena Peneva, and Pavel Stoev. ARPHA-BioDiv: A Toolbox for Scholarly Publication and Dissemination of Biodiversity Data based on the ARPHA Publishing Platform. *Research Ideas and Outcomes*, 3:e13088, 2017.

[19] Antoniya Hubancheva, **Viktor Senderov**, Manuela Nowotny, Stefan Schöneich, and Holger R Goerlitz. Bush-crickets show lifelong flexibility in courtship signals to match predation threat. *Available at SSRN 4237973*, 2022.

[20] Marius Garmhausen, Falko Hofmann, **Viktor Senderov**, Maria Thomas, Benjamin A Kandel, and Bianca Hermine Habermann. Virtual pathway explorer (viPEr) and pathway enrichment analysis tool (PEANuT): creating and analyzing focus networks to identify cross-talk between molecules and pathways. *BMC genomics*, 16(1):790, 2015.

[21] Emmanuel Arriaga-Varela, Matthias Seidel, Albert Deler-Hernández, **Viktor Senderov**, and Martin Fikáček. A review of the Cercyon Leach (Coleoptera, Hydrophilidae, Sphaeridiinae) of the Greater Antilles. *ZooKeys*, (681):39, 2017.

Conference Contributions

Talks

[22] **Viktor Senderov**. Treeppl - a DSL in Miking for phylogenetics, 2024. URL: `https://vsenderov.github.io/2024-miking-workshop-treeppl`.

[23] **Viktor Senderov**. How universal probabilistic programming languages democratize modeling in computational biology. In *14th Annual Research Day of School of Mathematical and Statistical Sciences of the University of Galway*, 2024. URL: `https://vsenderov.github.io/2024-galway-slides/`.

[24] **Viktor Senderov**, Amaury Lambert, Marie Manceau, Jean-Baptiste Desmarquet, Ingrid Lafontaine, and Hélène Morlon. A Probabilistic Programming Approach to Investigate the Coevolution of Genes and Phenotypes in Birds. In *ISMB/ECCB 2023 as part of the Evolution and Comparative Genomics (EvolCompGen) COSI.*, 2023.

[25] Savina Stoitsova, **Viktor Senderov**, Siyka Dimcheva, Vanya Rangelova, Ralitsa Raycheva, Meri Hristamyan, Ani Kevorkian, Jordanka Stoilova, Maria Atanasova, Atanaska Petrova, Marianna Murdjeva, Todor Kantardjiev, and Angel Kunchev. Seroepidemiologic study to detect antibody-mediated immunity against SARS-CoV-2 among residents and healthcare workers in the city of Plovdiv, Bulgaria, weeks 21-24, 2020. In *European Scientific Conference on Applied Infectious Disease Epidemiology (ESCAIDE)*. on-line, 2020.

[26] **Viktor Senderov**, Teodor Georgiev, Donat Agosti, Terry Catapano, Guido Sautter, Éamonn Ó Tuama, Nico Franz, Kiril Simov, Pavel Stoev, and Lyubomir Penev. OpenBiodiv: an implementation of a semantic system running on top of the biodiversity knowledge graph. volume 1, page e20084. Pensoft Publishers, 2017.

[27] **Viktor Senderov**, Teodor Georgiev, and Lyubomir Penev. Streamlining the Flow of Taxon Occurrence Data Between a Manuscript and Biological Databases. In *TDWG 2016 ANNUAL CONFERENCE*, 2016.

[28] Lyubomir Penev, Donat Agosti, Teodor Georgiev, **Viktor Senderov**, Guido Sautter, Terry Catapano, and Pavel Stoev. The open biodiversity knowledge management (eco-) system: tools and services for extraction, mobilization, handling and re-use of data from the published literature. volume 2, page e25748. Pensoft Publishers, 2018.

[29] **Viktor Senderov**, Teodor Georgiev, and Lyubomir Penev. Creation of Data Paper Manuscripts from Ecological Metadata Language (EML). In *TDWG 2016 ANNUAL CONFERENCE*, 2016.

[30] Lyubomir Penev, Mariya Dimitrova, **Viktor Senderov**, Georgi Zhelezov, Teodor Georgiev, Pavel Stoev, and Kiril Simov. OpenBiodiv: a knowledge graph for literature-extracted linked open data in biodiversity science. *Publications*, 7(2):38, 2019.

[31] Mariya Dimitrova, **Viktor Senderov**, Kiril Simov, Teodor Georgiev, and Lyubomir Penev. OpenBiodiv-O Ontology: Bridging the Gap Between Biodiversity Data and Biodiversity Publishing. *Biodiversity Information Science and Standards*, (7656), 2019.

[32] Lyubomir Penev, **Viktor Senderov**, and Teodor Georgiev. Next Generation Publishing for Biodiversity using Pensoft's Arpha Writing Tool and Publishing System. In *TDWG 2016 ANNUAL CONFERENCE*, 2016.

[33] Teodor Georgiev, **Viktor Senderov**, and Lyubomir Penev. Novel article formats in the ARPHA* Writing Tool and Biodiversity Data Journal. In *TDWG 2016 ANNUAL CONFERENCE*, 2016.

[34] Lyubomir Penev, Éamonn Ó Tuama, **Viktor Senderov**, Pavel Stoev, and Teodor Georgiev. Nanopublications for biodiversity: concept, formats and implementation. In *TDWG 2016 ANNUAL CONFERENCE*, 2016.

Posters

[35] **Viktor Senderov**, Amaury Lambert, Marie Manceau, Jean-Baptiste Desmarquet, Ingrid Lafontaine, and Hélène Morlon. Quantitative Tools for Assessing the Correlated Evolution of Genes and Phenotypes: Application to Birds' Color Patterns (Q-T-Birds). In *31st conference on Intelligent Systems for Molecular Biology and 22nd European Conference on Computational Biology*, 07 2023. doi:10.13140/RG.2.2.11356.36489.

[36] **Viktor Senderov**, Jan Kudlicka, Nicolas Lartillot, Daniel Lundén, Ignacio Quintero, Hélène Morlon, David Broman, and Fredrik Ronquist. Probabilistic Modeling of Bursts and Gradual Changes of Diversification Rates in Bird Evolution Diversification rate evolution under different models Background. In *Congress of the European Society for Evolutionary Biology*, 08 2022. doi:10.13140/RG.2.2.16389.52967.

[37] **Viktor Senderov**, Teodor Georgiev, Donat Agosti, Terry Catapano, Guido Sautter, Éamonn Ó Tuama, Nico Franz, Kiril Simov, Pavel Stoev, and Lyubomir Penev. OpenBiodiv Poster: an Implementation of a Semantic System Running on top of the Biodiversity Knowledge Graph. *Biodiversity Information Science and Standards*, 1:e20246, 2017.

Computer demos

[38] **Viktor Senderov**, Teodor Georgiev, and Lyubomir Penev. Demonstrating the Prototype of the Open Biodiversity Knowledge Management System. In *TDWG 2016 ANNUAL CONFERENCE*, 2016.

[39] **Viktor Senderov**, Teodor Georgiev, Donat Agosti, Terry Catapano, Guido Sautter, Éamonn Ó Tuama, Nico Franz, Kiril Simov, Pavel Stoev, and Lyubomir Penev. OpenBiodiv Computer Demo: an Implementation of a Semantic System Running on top of the Biodiversity Knowledge Graph. *Biodiversity Information Science and Standards*, 1:e20193, 2017.

Experience with acquisition of scientific funding

I have written three successful grant proposals: a Marie Curie postdoctoral fellowship proposal, a proposal for a Master's study for the German foreign exchange service (DAAD), and a scholarship application for the International University Bremen (now Jacobs). In addition, I have been awarded two prestigious positions within larger projects who were attracted by senior PI's: a Marie Curie Ph.D. position and a MemoLife postdoctoral researcher's position at the École normale supérieure (ENS) in France.

In the case of the Marie Curie postdoc as well as the Master's and Bachelor's scholarship I was the sole person responsible for acquiring the funding, and was responsible for management and writing reports. For my Marie Curie PhD and for my ENS position, I wrote applications for the positions directly, and was partially responsible for managing documents such as travel and budget after I was hired.

2022 – 2024   **MemoLife Postdoc: 165,000 EUR**, *IBENS UMR 8197—ENS*, Paris, France
Quantitative Tools for assessing the Correlated Evolution of Genes and Phenotypes: Application to Birds Color Patterns (Q-T-Birds) [24, 35]

2020 – 2022   **Marie Skłodowska-Curie Postdoctoral Fellowship: 203852,16 EUR**, *National Museum for Natural History*, Stockholm, Sweden
PhyPPL: first applications of probabilistic programming languages in phylogenetics [6, 7, 10, 11, 25, 36]

2015 – 2018   **Marie Skłodowska-Curie Position for a Ph.D. Study: 2,700 EUR/Month + research costs and overhead**, *Pensoft Publishers and Bulgarian Academy of Sciences*, Sofia, Bulgaria
BIG4 international training network: Biosystematics, informatics and genomics of the big 4 insect orders; OpenBiodiv project [?, 2–5, 12, 15–18, 21, 26–34, 37]

2012 – 2014   **Full DAAD scholarship for Master's study in Germany: 700 EUR/Month**, *LMU Munich*

2001   **Full scholarship for Bachelor's study: 15,000 EUR**, *International University Bremen, now Jacobs university*

Other scientific merits and achievements

April 2022   **Distinguished Artifact Award**, *European Symposium on Programming (ESOP)*
for the paper *Compiling Universal Probabilistic Programming Languages with Efficient Parallel Sequential Monte Carlo Inference* [11]

13 Feb 2018   **Featured article**, *Journal of Biomedical Semantics*
OpenBiodiv-O paper [26]

Google Scholar metrics

Metric	All	Since 2020
Citations	435	303
h-index	10	9
i10-index	11	9