

Pesho Ivanov

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SUMMARY

Postdoc in genome sequence analysis at Penn State University.
PhD from ETH Zurich, thesis: *Optimal sequence alignment using A**.
Ex-googler, mentor of olympiad informatics students.
Interested in cooperative social structures.

ACADEMIA

JULY 2023 — NOW	Postdoc in genome sequence analysis, Pennsylvania State University, repo: sweepmap <i>Prof. Paul Medvedev's Algorithmic Bioinformatics group (medvedevgroup.com)</i>
APR 2017 — APR 2023	PhD student, thesis Optimal sequence alignment using A* Repos: AStarix , minSH , astar-pairwise-aligner <i>Prof. Martin Vechev's Secure, Reliable, and Intelligent Systems Lab (sri.inf.ethz.ch)</i>
APR 2015 — FEB 2017	Master degree in Software Engineering (<i>extra-mural</i>), Shumen University, Bulgaria Thesis: <i>Framework for Genomic Reconstruction Algorithms</i>
JUN 2014	Bachelor degree in Informatics, Shumen University, Bulgaria <i>↑ interrupted due to Russian visa issues</i>
SEP 2009 — JUN 2013	Specialist degree in Applied Mathematics and Informatics, Moscow State University <i>↑ transferred to Moscow State University</i>
SEP 2008 — JUN 2009	Bachelor degree in Computer science, Sofia University, Bulgaria
SEP 2000 — JUN 2008	Mathematics and Physics profile <i>// award for most scientific achievements of his year</i> Shumen High school of Sciences, Bulgaria
<i>Additional:</i>	
SEP 2011 — JUN 2013	Master degree (<i>not accredited</i>) in Bioinformatics <i>// + taught algorithms to biologists</i> Yandex School of Data Mining, Moscow, Russia
JAN 2011	VISION AND MACHINE-LEARNING RESEARCH SCHOOL, ENS Lyon, France
JUL 2008	RUSSIAN SUMMER INFORMATICS CAMP, Kostroma, Russia <i>// 3 weeks of problems and theory</i>
AUG 2007	PHYSICS CAMP, Panitsite, Bulgaria <i>// 3 weeks of maths and physics</i>
2004 — 2007	SUMMER RESEARCH INFORMATICS CAMP, Varna, Bulgaria <i>// 2-week problem solving</i>
2001 — 2008	MATHEMATICS AND INFORMATICS PRIVATE SCHOOL "A&B", Shumen, Bulgaria

INTERNSHIPS

- JUN 2016 – | *Clonality language for analysis of lymphocyte single-cell RNA data* ([repo link](#))
MAR 2017 | Prof. Martin Vechev, [Software Reliability Lab](#), ETH Zurich
MD Emmanuella Guenova, [Dermatology Clinic](#), University of Zurich
- JUL 2013 – | Summer internship on [SPAdes](#) open source genome assembler // [chimera's presentation](#)
AUG 2013 | // [proof of concept: replication bugs to enhance assembly in open source assembler](#)
Prof. Pavel Pevzner's, [Algorithmic Biology Lab](#), St. Petersburg Academic University
- SEP 2012 – | Microbiological models designer // [Microcin modelling](#)
JUN 2013 | Prof. Konstantin Severinov's lab, [Institute of Gene biology](#), Russian Academy of Sciences
- JUL 2012 – | Research internship on probabilistic verification of biological models
AUG 2012 | // [virus-bacteria interaction](#) [Summary]
Prof. Martin Vechev's, [Software Reliability Lab](#), ETH Zurich
- JUL 2011 – | Computational Geometry Algorithms Library ([CGAL](#)) internship
AUG 2011 | [Google Summer of Code](#) // [implemented topological operators on tetrahedral meshes](#)
- JUL 2007 – | Developer of a bin-packing genetic algorithm for glass cutting optimization
SEP 2007 | [Telepol Net](#), Bulgaria // [appreciating evolution and first algorithm in production](#)

PUBLICATIONS

- Exact global alignment using A* with chaining seed heuristic and match pruning
R. Groot Koerkamp and P. Ivanov (equal contribution)
Oxford Bioinformatics 2024
- Fast and Optimal Sequence-to-Graph Alignment Guided by Seeds
P. Ivanov, B. Bichsel, M. Vechev
International Conference on Research in Computational Molecular Biology (RECOMB) 2022
- ASTARIX: Fast and Optimal Sequence-to-Graph Alignment
P. Ivanov, B. Bichsel, H. Mustafa, A. Kahles, G. Rätsch, M. Vechev
International Conference on Research in Computational Molecular Biology (RECOMB) 2020
- DEBIN: Predicting debug information in stripped binaries
J. He, P. Ivanov, P. Tsankov, V. Raychev, M. Vechev
Proceedings of the 2018 ACM SIGSAC Conference on Computer and Communications Security
- Ineffective antibody-dependent cellular cytotoxicity in patients with cutaneous T cell lymphoma
Y. Chang, M. Ziegler, D. Ignatova, P. Ivanov, R. Profanter, K. Kerl, R. Dummer,
E. Contassot, L. French, A. Cozzio, S. Misailovic, W. Hoetzenecker, M. Vechev, E. Guenova
EXPERIMENTAL DERMATOLOGY, 2018

TEACHING

SEP 2017 – NOW	Teaching Assistant for the courses <i>Algolab, Data structures and Algorithms, Parallel programming, Rigorous Software Engineering, Reliable AI, Theoretical Informatics</i> Computer Science department, ETH Zurich
SEP 2015, SEP 2018	Supervisor of high school students <i>Science&Arts school “Science Xplore”</i> , Viseu, Portugal
NOV 2013 – JUN 2014	Informatics competitions trainer for high school students <i>Mathematics and Informatics Private School “A&B”</i> , Shumen, Bulgaria
NOV 2013 – JAN 2014	Teaching Assistant for the Coursera Bioinformatics course <i>Prof. Pavel Pevzner</i> , University of California, San Diego
AUG 2010	Lecturer at school students informatics camp // strongest Russian competitors <i>Russian Summer Informatics Camp</i> , Saratov
MAR 2008 – JUN 2009	Teaching Assistant for “Design and Analysis of Algorithms” course <i>Faculty of mathematics and informatics, Sofia University</i> , Bulgaria
SEP 2008 – JUN 2009	Author of the problems in Online programming tournament <i>Musala Soft, Bulgaria</i> // mainly discrete optimization problems
2008 – 2009 2013 – 2014	Author of problems for Bulgarian Tournaments in Informatics Lecturer at National Informatics Camps <i>National Committee in Informatics, Bulgarian Ministry of Education</i>

INDUSTRY

SEP 2014 – Software Engineer at Search \supset Knowledge \supset Infrastructure
JAN 2016 *Google Zurich*

AWARDS

the competitions are National Bulgarian if nothing else stated

1 st place	“MINKO BALKANSKI” COMPETITION IN INFORMATICS ’08
11 th place	TOPCODER HIGH SCHOOL FINALS, WEST LAFAYETTE, USA ’08
1 st place	AUTUMN TOURNAMENT IN INFORMATICS ’07
1 st place	STUDENT COMPETITION FOR THE DEAN’S CUP OF SOFIA UNIVERSITY ’07
2 nd place	INTERNATIONAL YOUNG PHYSICISTS TOURNAMENT (REGIONAL, IN TEAM) ’06
1 st place	“RUMEN GROZDANOV” INFORMATICS AND MATHEMATICS TOURNAMENT ’06
1 st place	WINTER TOURNAMENT IN INFORMATICS ’06

- Awarded as a **National Laureate in Informatics**, Bulgaria ’08
- Scholarship for science achievements of [AMERICAN FOUNDATION FOR BULGARIA](#) ’07–’08
- Participated in the **final rounds** of the BULGARIAN OLYMPIAD IN INFORMATICS ’05–’08
- Participated in the **final rounds** of the [TOPCODER HIGH SCHOOL](#), West Lafayette, USA ’07–’08
- Participated in the **final rounds** of “[MUSALA SOFT AND PC MAGAZINE](#)” competition ’07–’08

GENERAL SKILLS

Algorithms: Graphs, Combinatorics, Strings, Geometry, Optimization, Dynamic Programming
Programming: C / C++ (STL), Python (NumPy, SciPy, Matplotlib), MATLAB
Tools: Unix, Bash, Vim, Git, ~~TEX~~ \LaTeX
Fluent in: English, Russian, Bulgarian

ACTIVITIES

- Solving algorithmic problems // [TOPCODER](#), [TIMUS](#), [ROSALIND](#)
- Supporting crowdsourcing, FOSS and open data
- Editing [wikipedia](#)
- Running // 42.195km in 3:43h, Zelenograd, Russia, Dec 2011
// 100km in 13:19h, Vitosha mountain, Bulgaria, 2012
- Flying // [SPEEDFLY](#), [ACRO-PARAGLIDING](#), [CROSS-COUNTRY PG](#), [SKYDIVE](#)
- Meditation // [GOENKA’S 10-DAY MEDITATION RETREAT](#), 2020