

## Ljubomir JOSIFOVSKI

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<b>Summary</b>	ML/AI researcher/engineer/scientist in industrial R&D. Looking to apply: ASR lattice decoding insights into Chains-of-Reasoning in Reinforcement Learning at train and test time. DSPy prompting using English as programming language building a next high level computing platform. Featuring New-as-Old: Socratic LLM dialogue as Programming, Agent enacting dialogue as Code running, LLM Inference as CPU, Context as RAM. Prior life: Quantitative researcher, analyst, developer, building & trading systematic equity/FX models - including forecasting, portfolio optimisation, risk management, operations, post trade analysis - at hedge funds, proprietary trading desk, as independent Portfolio Manager. (20yrs) Prior-prior life: PhD Automatic Speech Recognition in noise, MSc Text-To-Speech synthesis. Spoken documents indexing & retrieval with spoken queries. Natural Language Processing. Background: analytical maths/stats/CS/EE, machine learning, statistical modelling, industrial research & development. Competent developer in C, C++, shell, MATLAB, python, C#, Sql on Linux, Mac, Windows. Self-sufficient systems & network admin.	
<b>Skills</b>	C/C++/OpenMP, MATLAB, bash, vim, awk, SQL, PostgreSQL, MS SQL Server, c/make, gcc, gdb, ddd, shell tools, ssh, rsync, screen, VSCode, python, jupyter, Spyder, git, mercurial, cvs, MS Teams, github, R, Java, C#, Visual Studio, Slurm, Condor, Compute Cloud, Bloomberg terminal/API, Reuters Kobra, assembly, Agents: Claude Code (cli, web), Codex (cli, addon), Cursor, Gemini-cli, Cline with Codex and local LLM-s served, local agents local models () for python, javascript, CSS/html, debugging C++.	
<b>Platforms</b>	Linux (X/Ubuntu, CentOS), MacOS, MS-Windows (from DOS to v11), Cloud/cluster, Unix (HP-UX, AIX).	
<b>Work</b>	Oct 25 - Now	<i>FutureSearch, (fully remote wfh; distributed - US, UK, EU)</i> <i>Position: Research Scientist.</i> AI LLM-s based agents for research, reasoning and forecasting. Python, TypeScript + cloudy LLM-s API-s + Dagster, LangFuse & like tools. Agentic use of financial data.
	May 16 - Now	<i>F9 Research, Harpenden, UK</i> <i>Position: Director.</i> Quant research, development and trading. Portfolio manager, run a small market neutral book ~350M USD gross, trading ~35M USD daily in the EU markets (and a small R&D US book). Consulting for quant R & D for a client, working on higher frequencies and short horizons (seconds and minutes) in C/C++, OMP, python, Matlab, PostgreSQL, cloud boxes and Slurm cluster. Input into varying aspects of the R&D pipeline - from informing and assessing latest technologies (including ML) to interviewing new teams members. Re-engaged with ML/AI via llama.cpp, open source open weights local models, coding agents Gemini/Codex/Claude-cli and LLM API-s, local agents with local models (qwen3, gpt-oss) for python, javascript, CSS/html, debugging C++. Modelled transcripts data with doc2vec. Applied new ML methods in forecasting tabular data (c.f. Hugging Face TabArena). F9 owns the IP to all and any R&D work done.
	Feb 10 - Mar 16	<i>Marshall Wace, London, UK</i> <i>Position: Quantitative Researcher.</i> On the TOPS QR team, senior team member among a handful of people, creating research, developing code, shepherding the market neutral portfolio growth from a few hundred millions to double digit billions USD gross book size. Ushered the idea of a single unified framework for all quant R & D & trading with standardised components - data ingestion and caching, signals extraction, modeller for forecasting, portfolio optimizer, trades simulator, standardised reporting, a baseline sim faithful and realistic to be continuously improved on by the entire team working in unison on various components of the system. Wrote or significantly contributed to major components of the system through their iterative improvements over the years. Big projects in production improving the then best baseline: dynamic modeller fitting the alpha signals expected returns at multiple horizons, incorporating both prior knowledge, constraints, and the evidence from historical data, market impact model in the simulator and the optimizer including slippage monitoring tuning and balancing risk cost of undercharging with the opportunity cost of overcharging, liquid concentrated low TO high capacity market neutral portfolios, 150/50 portfolios mix of tracker and market neutral, shepherding the trade scheduler deployment in production, alphas signals GeoSales, Suppliers-Customers, Directors deals, various reverting signals, 1st quantitative research and assessment on the in-house Alpha Capture signal. Guided and helped younger hires from onboarding to them becoming fully productive wholly effective team members. Pioneered reproducible research at scale using multi cpu multi core R&D boxes with establishing and popularising best practices.

	Nov 07 - Nov 09	<p><i>Credit Suisse, London, UK</i></p> <p><i>Position: Quantitative Analyst.</i></p> <p>On the Index Arbitrage proprietary trading desk. Independently traded equity market/sector/factor neutral portfolios on multiple European markets, fully automated and systematic, non-discretionary. Wrote own trading, analytics, backtest and portfolio construction systematic trading platform consisting of a Matlab core, Mosek optimiser, bash/awk scripts, Reuters Kobra Excel and Sql for historic and current data, with integrated risk monitoring and control using Barra's style factors and sectors. Used the platform to research and trade all the strategies and portfolios. Alone did orders generation, portfolio construction, forecasting &amp; modelling, all data feeds (Reuters, Sql dumps), the daily monitoring, trading analysis and slippage tracking and any other R&amp;D&amp;ops as needed for trading. Traded multiple portfolios daily of ~500 names in total on London, Paris, Frankfurt, Switzerland, Milan and Madrid exchanges, one trade per day per name. Did R&amp;D simulations for intra-day horizons faster TO. In 2008 traded the London portfolio most of the year as a test bed for all research &amp; development, returning 10% gross in 230 days with Sharpe of 2.5. In 2009 traded bigger book on most of the European markets, returned 8% gross to Aug'09 with Sharpe of 5.2, turnover 2-3 days, one trade per name per day. All together lifetime (388 days) return on gross 18% at Sharpe of 3.1.</p>
	Jul 04 - Sep 07	<p><i>G-Research (part of the DPFM group), London, UK</i></p> <p><i>Position: Quantitative Analyst.</i></p> <p>Research (70%), development (20%), daily portfolio monitoring and support (10%) in a multi-billion market neutral hedge fund systematically trading global equities and spot FX round the clock in a completely automated system. Research and creation of new trading models/alphas, coding, testing in simulation and putting them in production. Models for volume prediction, fundamentals and technical equities models (multiple markets,), spot FX - all productionised and live traded. Built futures models but not traded live. Development included coding up the models, the associated data analytics, and subsequent performance and integrity monitoring once live. The portfolio support role involved monitoring the trade flow, market conditions and risk factors, investigating/tuning the trading. In the process familiarised myself with forecasting and modelling, performance attribution, multiperiod quadratic portfolio optimisation, risk measurement and management (Barra, APT, custom factors), real-time and historic data feeds, data aggregation. Independently came up with original alphas building on well known semi-parametric models for forecasting that were traded live in equities and spot FX trading. Similarly contributed alphas based on novel non-parametric models used for trading equities. They were all profitable, contributed to the bottom line and were traded along the other alphas.</p>
	Jun 01 - Jun 04	<p><i>Canon Research Europe, Bracknell, UK.</i></p> <p><i>Position: Researcher.</i></p> <p>Research &amp; development work in the Machine listening group on ASR and indexing &amp; retrieval of spoken documents. Contributed to all aspects of Canon's low resource embedded multiplatform ASR engine: the front-end (DSP related), decoder (Mpeg7 compatible lattice creation), training &amp; using statistical models (acoustic HMM multilingual, text-to-phone Ngrams). Group demonstrated embedded speaker independent phone book name dialling on ARM9 &amp; ARM7 phones. Phonetic indexing of spoken documents/annotations &amp; retrieval with spoken &amp; written queries. Invented &amp; implemented in the embedded C++/C codebase novel algorithm for searching annotation (speech) lattices with a query (speech) lattice, outperforming other known techniques for phonetic SDR (LATTICE MATCHING, UK Patent App No 0316669.1, accomp app ref 2865001, Jul 2003). Demoed playlist entry selection by voice for an MP3 player, performing in near realtime on Windows CE platform with 1500 entries.</p>
	Nov 00 - Jun 01	<p><i>Motorola European Research Lab, Basingstoke, UK.</i></p> <p><i>Position: Research engineer.</i></p> <p>Technology transfer from my PhD work to Motorola (my industrial sponsor). Research on the distributed speech recognition (DSR) ETSI Aurora 2 standard platform. Developed robust ASR algorithms in Matlab, GNU C/C++ and tested them on Cygwin, HP-UX and Linux platforms. Lab was part of the winning consortium of the ETSI Aurora 2 standardisation competition for mobile phones robust front-end.</p>
	Nov 97 - Jan 98	<p><i>Macedonian Banking Operations Centre (USAID funded project for technical support of the financial sector in Macedonia), Skopje, MK.</i></p>

		<p><i>Position: Management Information Systems - Electronic Data Processing (MIS-EDP) Advisor.</i></p> <p>In a team of advisers analysing operations of commercial banks in Macedonia. Handled the MIS-EDP operations of the banks surveyed, reported on the state of and recommended improvements. By the end of the project all commercial banks in Macedonia volunteered to have their operations surveyed and reported on.</p>
	Nov 93 - Oct 97	<p><i>Faculty of Mechanical Engineering, University Sv. Kiril i Metodij, Skopje, MK.</i></p> <p><i>Position: Systems engineer.</i></p> <p>Solely responsible for maintaining all faculty computers (100+ PCs, 10+ Unix workstations), faculty LAN spanning 3 buildings, other computing-related equipment (printers, terminal servers, router). Faculty LAN massively expanded, doubled the size of existing and added a second computerised classroom for students and lab classes, introduced email &amp; other Internet services to every staff member and student, phased out legacy systems (VT420 terminals, terminal servers). Maintained/supported collection of legacy Clipper/FoxPro accounting applications.</p>
	Jun 93 - Oct 93	<p><i>NeoCom, Skopje, MK.</i></p> <p><i>Position: System integrator.</i></p> <p>In small &amp; dynamic company, clients facing, computer systems assembly, integration, software installation, maintenance (PC/Windows), computer networks (Novell NetWare, Windows LAN) installation &amp; maintenance on- and off-site.</p>
	1986 - 1993	<p><i>Freelance S/W developer, undergraduate &amp; hobby programming</i></p> <p>Basic &amp; assembler (6502) on home computers. Mission critical (firing heavy guns) on pocket computers (HP-71B, Sharp 1500) and TurboPascal (Apple II+CP/M board+HDD) while national service (army). MS-DOS systems programming (C &amp; assembler, TSR programs: screen capture, serial port snoop, DOS trashcan), network programming (NetBIOS based LAN messenger, IPX chat, IPX stack emulator in DesqView), PC databases (video shop rental application in Clipper, various applications in FoxPro, document flow in MS-Access).</p>
<b>Education</b>	1998 - 2000	<p><i>Doctor of Philosophy Ph.D. (Full-Time)</i></p> <p><i>Speech and Hearing Group, Department of Computer Science, Faculty of Engineering, University of Sheffield, UK.</i></p> <p>Independent research into recognising speech in noise. Missing data model treats parts of the speech spectrum swamped by noise as unobserved/partially observed, giving rise to a probabilistically modelled mask that has to be incorporated in the frame-by-frame adapted speech model. Work involved theory of automatic speech recognition as well as practice, training HMMs with continuous GMM pdfs using EM (HTK, shell scripting), writing and using Viterbi decoders and frontends to test novel noise robustness algorithms, noise and SNR estimation (Matlab, C++, C). Part of EC ESPRIT LTR programme funded RESPITE project of 5 research labs and 2 industrial partners and EC TMR programme funded SPHEAR network.</p> <p>Thesis: "Robust speech recognition with missing and unreliable data". (Viva Dec 2002)</p>
	1993 - 1997	<p><i>M.Phil. Electrical Engineering (Part-Time)</i></p> <p><i>Department for Computers and Informatics, Faculty of Electrical Engineering, University Sv. Kiril i Metodij, Skopje, MK.</i></p> <p>Studies consisted of taught part (2 years/4 semesters) for 6 courses and thesis work (1 year/2 semesters) followed by a viva. Courses achieved avg grade 10 (scale 6-10, 10 best). Projects: video-over-IP frame rate control and QoS using UDP non-blocking sockets (C/C++, part of a system for tele-teaching system); database of Medieval Manuscripts (Delphi). Thesis/research - built system for converting written text into speech. Rudimentary time-domain, syllable based TTS. Created a database of 1200 syllables, wrote TTS engine breaking the input text into syllables (using an NN MLP), concatenating the units from the syllable database, generating F0 and the duration contours, modifying the syllable units accordingly in time domain. Gathered and labelled data, trained a two layer, feed forward MLP (neural network) to mark syllable breaks in the input text. Part of a larger project for automatic text reading for the blind.</p> <p>Thesis: "System for text-to-speech conversion for Macedonian language".</p>
	1988 - 1993	<p><i>B.S. Electrical Engineering (Full-Time)</i></p> <p><i>Department for Computers, Informatics and Automation, Faculty of Electrical Engineering, University Sv. Kiril i Metodij, Skopje, MK.</i></p>

		<p>Taught studies 4.5 years (9 semesters) followed by a diploma work (1 semester) and public presentation. Achieved average grade of 8.78 (scale 6-10, 10 best).</p> <p>Diploma project: "Introduction to DECNET, Bitnet (EARN) and Internet networks; E-mail/File transfer services; X.25 Network and out-dial NUAs".</p> <p>Best student within my college class in years 1 &amp; 2. Ranked 1st (100 points out of 100) among of approx 800 candidates at the University entrance exams.</p>
	1983 - 1987	<p><i>R.J. Korcagin High School, Skopje, MK.</i></p> <p>Mathematics and Computer Science High School, achieved GPA 5.00 on a 2 to 5 scale (5 best), voted best pupil ("valedictorian") of the 1983-87 generation.</p>
<b>Nationality</b>	UK (acquired/by choice), Macedonian (by birth). Born 1968.	
<b>Languages</b>	English, Macedonian (native), Croatian, Serbian.	
<b>Honours &amp; Awards</b>	<p>Scholarships: merit research &amp; science 1988-93, talented student 1983-87. Best student 1989,'90.</p> <p>Maths competitions prizes: Regional 1st 1984, '86, '87, 3rd 1985; Republic 3rd 1984, '85, '87;</p> <p>National participation 1984, '85, praise 1987.</p>	
<b>Other</b>	<p>UK and MK driving licences, married, two grown up children.</p> <p>Interests include science, technology, innovation, knowledge, epistemology, culture, arts, non-fiction, systems theories, solar punk, political economy, quantitative finance, history, ethics, mentoring, e/acc.</p>	