# Jennifer Da Silva Baumgart

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I am an analytical chemist who moved into AI engineering, and in both careers I have asked the same question: can this output be trusted, and by whom? After about ten years of analytical measurement in research and industry, I spent three years building production software, including evaluating LLM systems for reliability, hallucination and robustness before release. In industry I repeatedly saw systems that made sense to the people who built them fail to make sense to the people who used them.

## RESEARCH INTERESTS

ethics of AI in health · fairness, bias and trustworthy AI · human–computer and human–AI interaction · digital health · chronic and under-diagnosed conditions · mental health

## EDUCATION

**MSc Human-Centred Artificial Intelligence** Sep 2026 – Sep 2027
*Newcastle University, UK*

- Spärck AI Scholarship (fully funded)
- Modules: Machine Learning with Project; Human–AI Interaction and Futures; Introduction to Human–Computer Interaction and UX; Engineering for AI; Complex Data Visualization; Image Processing.

**Tecnólogo in Systems Analysis and Development (UK Level 5 equivalent)** Feb 2023 – Jul 2025
*Centro Universitário Internacional Uninter, Brazil · GPA 9.4/10*

**Postgraduate Specialisation (Lato Sensu) in Criminalistics and Forensic Sciences** Feb 2018 – Jun 2020
*IPOG, Brazil · GPA 9.5/10*

**BSc Chemistry** Feb 2012 – Dec 2017
*Universidade Regional de Blumenau (FURB), Brazil · GPA 8.18/10; dissertation graded 9.8/10*

**Academic exchange, BSc Forensic Science (non-degree)** Sep 2014 – Aug 2015
*De Montfort University, Leicester, UK · Fully funded by the Science without Borders Scholarship*

## RESEARCH EXPERIENCE

**Independent researcher — Auditing diagnostic overshadowing in LLM health advice** 2026 – present

- Designing a counterfactual audit of whether general-purpose LLMs attribute hypermobility-type (hEDS) symptoms to autism or ADHD in women, varying gender, neurodivergence, symptom presentation and patient versus clinical framing.
- Methods: factorial vignette design across five LLMs to control for prompt variation; outcomes coded with an LLM-assisted scheme validated by human coders (Cohen's $\kappa \geq 0.70$) and analysed with mixed-effects logistic regression; pre-registration on OSF planned.

**Undergraduate dissertation — Identification of cocaine residues on circulating banknotes** 2017
*FURB, Brazil · Supervisor: Dr Martinho Rau · graded 9.8/10*

- Sampled 85 banknotes from seven areas of Blumenau over six months, including before and after Oktoberfest, to test whether the festival increased contamination.
- Compared two GC-MS temperature programmes and adopted one that shortened the run to 23 min without appreciable loss of sensitivity. Identified cocaine by its characteristic fragment ions and NIST library matching on 76 of 85 notes (89%; 67–100% by area). The Oktoberfest hypothesis was not supported.
- The planned silica/alumina clean-up retained the cocaine itself while leaving the lipid interferents. Larger elution volumes, nitrogen concentration and cold precipitation did not resolve this, and without a reference standard I could not run spike-recovery tests to confirm whether ultrasound improved extraction. I therefore restricted the study to qualitative identification and treated the co-extracted compounds as data: correlations between cocaine and the major chromatographic peaks grouped the areas into three chemical profiles, suggesting at least three distinct sources.

**Independent summer research project — Forensic discrimination of lipsticks** 2015
*De Montfort University, UK · Supervisor: Prof. Richard Brawn*

- Designed and carried out, as the sole researcher, a study of whether nine visually similar red-to-pink lipsticks from five brands could be told apart as trace evidence, comparing three low-cost techniques: ATR-FTIR, a video spectral comparator (VSC) and CIELAB colour measurement from photographs.
- In FTIR, compared two peak-area integration methods with peak absorbance on the C–H and C=O stretching bands, in triplicate. Peak areas varied by up to ~40% between replicates, so I recommended absorbance intensity as the more repeatable measure.
- The VSC distinguished all nine products under UV, but only by combining several wavelengths. For colour, I compared 5×5 and 101×101-pixel sampling windows and found that uneven smears limited precision.

**Undergraduate research fellow — Enzymatic versus chemical functionalisation of polyester and polyamide fabrics** 2013 – 2014
*FURB, Brazil · Supervisor: Prof. Jürgen Andreaus · Funded by CNPq and FURB*

- Led the polyester (PET) strand of a project comparing two hydrolases (cutinase and lipase AY) with conventional NaOH treatment as a milder route to making synthetic fabrics more water-absorbent and dyeable. Designed the protocols and ran treatments from 1 to 24 h in triplicate. A second fellow joined near the end to take over the polyamide strand when I left for the UK exchange. First author of the project's final report.
- Evaluated each treatment with three complementary measures: wicking tests for hydrophilicity, reflectance spectrophotometry (K/S, Kubelka–Munk) after reactive dyeing, and UV-Vis scans of the treatment liquors for released terephthalic acid. All treatments increased the hydrophilicity of PET, most clearly cutinase and NaOH. Dye uptake improved only slightly over untreated fabric and did not depend on treatment time.

- Measured enzyme activity spectrophotometrically (pNPB assay) in water/ionic-liquid mixtures (EMIM Cl, 0.5–94%). High concentrations inhibited both enzymes and low concentrations enhanced activity. Because the ionic liquid's own absorbance interfered with the readings, every run was baseline-corrected, and the resulting negative values in some runs were reported as a limitation.

## PUBLICATIONS AND PRESENTATIONS

- Balestrin, K. M., Andreaus, J. and **da Silva, J.** (2014). *Lipase e esterase para a funcionalização de fibras de poliéster e sua atividade em líquidos iônicos* [Lipase and esterase for the functionalisation of polyester fibres and their activity in ionic liquids]. Proceedings of the 8th MIPE, FURB, p. 144. ISSN 2525-4723. Conference abstract; my polyester and ionic-liquid work.
- Balestrin, K. M., Andreaus, J. and **da Silva, J.** (2014). *Funcionalização química e enzimática de fibras de poliamida* [Chemical and enzymatic functionalisation of polyamide fibres]. Proceedings of the 8th MIPE, FURB, p. 143. ISSN 2525-4723. Conference abstract.
- Oral presentation of the fibre functionalisation work, 8th MIPE, FURB, Brazil (2014).

*Published under my former name, Jennifer da Silva.*

## PROFESSIONAL EXPERIENCE

**Co-Founder and CTO** Jan – Sep 2026
*Texlink, Brazil*

- Designed and built the company's B2B platform from scratch as its sole engineer, leading a second developer who joined in the final month. The platform connects fashion brands with garment factories and tracks orders through more than 20 production stages, defined with the co-founders from their knowledge of factory workflows.
- Testing with real users showed that order statuses which were logical from a software perspective did not reflect how factories actually work, and that many factory users had limited digital experience. I remodelled the workflow and simplified the interface accordingly, and verified core features with automated tests (116 for the order-reporting module alone).

**AI Software Engineer (LLMs, RAG, agentic AI)** Sep 2025 – Mar 2026
*Straas.tech, Brazil*

- Designed and built a multi-tenant retrieval-augmented generation (RAG) knowledge platform, used mainly for customer-service chatbots that answer from each organisation's own documents with source citations.
- Evaluated it before release: built golden sets of test questions with expected answers and scored responses against a rubric for correctness, tone and completeness. Checked retrieval and generation separately, testing whether the system returned the right passages and whether answers stayed faithful to them rather than hallucinating, so that each failure could be traced to its source.
- Tested robustness with adversarial and jailbreak prompts, compared models and prompt versions side by side, and re-ran the test suite as regression checks after every change, alongside user feedback from production. Documented failures and argued for changes from that evidence.
- Also built agent workflows using the Model Context Protocol and added natural-language interfaces to products (React, Next.js, Python/FastAPI), working closely with designers.

**Frontend Engineer and UI/UX Designer** Aug 2024 – Aug 2025
*Minerva Controls, Brazil*

- Designed and built dashboards presenting predictive-model outputs (equipment health, bottlenecks, controller performance) on digital-twin platforms for heavy industry, for clients including Shell and Petrobras.
- When feedback showed that users struggled to understand the model outputs, I revised chart types, colour encoding and terminology to make predictions interpretable for non-specialists. Designed interfaces to WCAG accessibility guidelines and added automated interface tests.

**Full-Stack Engineer (Freelance)** Nov 2023 – Aug 2025

- Built web applications from design to production (React, Next.js) and advised clients on accessibility. Before that, frontend developer at The Brooklyn Brothers (2023), on Unilever campaigns in more than 15 markets.

**Colour Development Specialist** 2020 – 2023
*Coteminas, Brazil*

- Developed around 20 new colour recipes a month for textile printing, combining reflectance spectrophotometry and recipe-prediction software with iterative lab trials to match targets within tight colour-difference tolerances.
- When production batches drifted from the approved standard, diagnosed the cause and reformulated a correction. This was harder than the original development, because the new colour had to be built over the off-shade fabric rather than from a clean base.

**Earlier chemistry roles** 2015 – 2017

- **Cremer (2016–2017):** quality control of hospital products such as dressings and adhesive tapes. Investigated customer complaints by testing whether reported defects could be reproduced, and fed confirmed causes back to production for correction.
- **Umwelt (2015–2016):** microbiological and chemical analysis of water and effluent for compliance with Brazilian legal discharge limits (CONAMA).
- **Brewing and malting school (2016):** laboratory technician, preparing chemistry and microbiology labs and supporting teaching.

## SCHOLARSHIPS AND AWARDS

- **Spärck AI Scholarship** (2026). Fully funded MSc. One of around 80 scholars in the first cohort of a new UK Government (DSIT) programme across nine universities, including Oxford, Cambridge, Imperial and UCL.
- **Science without Borders Scholarship** (2014 – 2015). Merit-based Brazilian federal government scholarship for a year at a UK university; selection required a minimum score of 600 in ENEM (Brazil's national exam), English proficiency and a strong academic record.
- **Best Pitch Award**, Spärck AI Scholarship launch hackathon (2026), selected from 10 teams, for a concept AI agent supporting symptom reporting in complex palliative care.
- **1st place, Conecta Saúde Health Tech Hackathon** (2025). Humanus, a career platform for nurses.

## DIGITAL HEALTH PROJECTS

**AI agent for symptom reporting in complex palliative care — concept and prototype** 2026
*Spärck AI Scholarship launch hackathon*
Conceived an AI agent to help patients and family members, the people who live with symptoms day to day, keep track of and report symptoms in complex palliative care, designed for the NHS context.

- My contribution: the original idea and the working prototype; the team developed the pitch together, which won the Best Pitch Award among 10 teams.
- The prototype left two questions open that I would like to study: how far a system should rely on a family member's report when the patient cannot report for themselves, and when the agent should stop collecting information and hand the case to the clinical team.

**Moodz — Online group therapy and peer-support platform** 2023 – 2026
*Co-founder and product architect*

- Began as a personal initiative to address the lack of accessible mental-health support for neurodivergent and chronically ill adults, combining professional group therapy with peer-support communities.
- Designed it around accessibility, safety and dignity rather than engagement: a low-cognitive-load interface and gentle progress tracking that supports continuity without pressure. Designing it raised the questions that led me to responsible AI: what a system should surface, how it should handle sensitive moments, and when it should defer to a human.
- Developed to prototype, pitched at Techstars Startup Weekend Blumenau (2025) and selected for pre-incubation; paused in 2026 to focus on research.

**Humanus — Career platform for nurses** 2025
*Conecta Saúde Health Tech Hackathon · 1st place*

- Addressed the lack of a structured career path for nurses and nursing technicians. In a team with two nurses and a business specialist, I led the design and built the working prototype in three days (Next.js, Node.js), translating complex professional requirements into microlearning, career planning and one-to-one session booking.

**VidaPlus — Healthcare management system** 2025
*Final project, Tecnólogo in Systems Analysis and Development*

- Designed and built end to end, in under six weeks, a system for patient records, appointments, prescriptions and exams, with role-based access so that each clinical role sees only the information it needs.

## LEADERSHIP AND SERVICE

- Elected Course Representative, MSc Human-Centred AI, Newcastle University (2026 – present)
- Member, Student–Staff Committee, School of Computing, Newcastle University (2026 – present)

## SKILLS AND LANGUAGES

- **AI and data:** machine learning in Python (scikit-learn, PyTorch, TensorFlow), data analysis and visualisation (pandas, NumPy, matplotlib), SQL, LLM integration and evaluation, retrieval-augmented generation, vector databases and semantic search, FastAPI
- **Research methods:** experimental design, statistical and correlation analysis of real-world samples, LLM evaluation (golden sets, rubric scoring, adversarial testing), usability testing; qualitative methods: semi-structured and in-depth interviews, participant and non-participant observation, ethnography, grounded theory
- **Laboratory:** GC-MS, HPLC, infrared and UV-Vis spectroscopy, reflectance spectrophotometry, quality control
- **Software and design:** TypeScript, React, Next.js, Node.js/NestJS, PostgreSQL, Docker, AWS, CI/CD; Figma, design systems, accessibility (WCAG)
- **Languages:** Portuguese (native) · English (IELTS Academic 7.5 overall) · Spanish (B1) · French (A2)