

KSENIIA STARODUBTSEVA

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EDUCATION

B.Sc. Data Analysis — University of Messina (MIFT Department) 2022 – 2026 (expected)
International Relations & Entrepreneurship — Saint Petersburg State University 2019 – 2022

TECHNICAL SKILLS

Programming & Querying: Python, Java, JavaScript/TypeScript, C, SQL
Backend & APIs: Node.js, Express, FastAPI, REST API Design, SQLAlchemy
Frontend: React, React Flow, HTML/CSS
AI/ML: scikit-learn, XGBoost, Pandas, NumPy, Classification, Clustering, NLP (BERTopic/LDA), NetworkX
Security: JWT, RSA/X.509, AES-256-GCM, Secure System Design
Databases: PostgreSQL, SQLite, MongoDB, Neo4j
Infrastructure & Tools: Docker, Docker Compose, Git, Agile/Scrum
Spoken Languages: English (fluent), Russian (native), Italian (fluent)

EXPERIENCE

Security Research Intern — University of Messina June 2026
75-hour internship · JWT (RFC 7519) · Node.js/Express · React

- Designed and implemented a JWT-based authentication architecture across a three-component microfrontend system, applying explicit algorithm allow-listing to mitigate JWT algorithm-confusion attacks and in-memory token storage to reduce XSS exfiltration surface.
- Wrote and ran a scripted Node.js security test suite covering 6 adversarial scenarios against the live server — all 6 passed.
- Conducted a literature review of microfrontend security challenges and authored a technical report documenting 6 concrete hardening findings with severity ratings and remediation recommendations.

Freelance QA Tester — Crowdtesting Platforms (e.g., TestIO) 2021 – 2022

- Executed structured testing across web and mobile applications, identifying functional and UI/UX defects across devices, operating systems, and browsers.
- Logged reproducible bugs with severity, expected vs. actual behavior, and clear reproduction steps.

PROJECTS

Digital Forensics Investigation Workspace 2026
React 18 · FastAPI · SQLAlchemy · SQLite · Docker Compose · React Flow

- Architected a full-stack web app for digital investigators to upload, analyze, and correlate evidence files (images, PDFs, text), with metadata extraction and binary-signature-based file-type detection.
- Designed a custom multi-signal anomaly-scoring algorithm and a weighted evidence-correlation graph (weighted adjacency, degree centrality) with a priority-based BFS to rank next investigative steps.
- Applied the Strategy and Repository design patterns to keep the analyzer pipeline extensible (Open/Closed Principle) and the data-access layer decoupled from business logic; containerized the full stack with Docker Compose.

Vendor Behavior in Darknet Marketplaces — Comparative ML Analysis 2026
Python · scikit-learn · XGBoost · NetworkX · BERTopic · lifelines

- Compared vendor behavior across two darknet marketplaces to identify machine-learning-based precursor signals distinguishing exit-scam collapse from voluntary shutdown.
- Applied DBSCAN/K-Means for vendor segmentation, LDA/BERTopic for topic modeling of listings, and Logistic Regression/Random Forest/XGBoost for vendor classification and pre-closure prediction.
- Constructed vendor interaction networks (NetworkX, Louvain community detection) and combined Isolation Forest/LOF anomaly detection with Kaplan-Meier survival analysis to model vendor lifespan.

MedAuth — Secure Medical Data Upload System June 2026
Node.js · Express · HTTPS · JWT · RSA/X.509 · AES-256-GCM · Hyperledger Fabric · SQLite

- Developed a Node.js/Express HTTPS server enforcing a six-node federated verification pipeline with JWT authentication, RSA signatures over X.509 certificates, anti-replay nonces, domain-policy rules, and duplicate detection to block fake or tampered medical records.
- Implemented AES-256-GCM encryption at rest and integrated Hyperledger Fabric to provide an immutable, tamper-evident blockchain ledger for medical record integrity, with a dedicated chain-verification endpoint.
- Built automated attack-simulation scripts covering replay, file tampering, certificate revocation, and cross-user access, verifying that each defense layer blocks malicious requests.

Munch — Full-Stack Food Delivery Platform Sept 2024
MERN Stack (MongoDB, Express, React, Node.js) · Stripe API

- Built a full-stack food delivery platform with secure user authentication, Stripe payment integration, and an admin panel for managing users and orders, with a mobile-responsive UI.

ADDITIONAL

- Co-founder & Developer, independent web product studio — end-to-end development; partner leads UX/UI.