

Adem USTA

Software Engineer - Tech Lead

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31 years old, French



Work experiences

Nov. 2022 **Senior Backend Engineer (Freelance) @ AnotherBrain**

March 2023

Within the 'Business Unit' team, I was involved in working on several topics around the 'Phosphor Quality' solution.

Setting up a monitoring stack on the existing product.

- Configuration and deployment of a complete monitoring stack (Exporters, Prometheus, Grafana, AlertManager) on the existing product,
- Design of a data retention and long-term storage solution.

Implementation of best practices and improvements to the existing system.

- Python3.x service template with multiple targets and smooth development experience (Dev containers),
- Fully functional code quality checkers suite (isort, black, pylint, mypy),
- Advanced use of poetry,
- Optimized multi-stage containerization (docker).

Setting up a PoC around a new software quality control solution called 'CrystalClear'.

- Design of a docker services architecture exposing HTTP APIs,
- Deployment of the solution using docker-compose,
- Setting up a smooth development environment.

Python - Poetry - Docker - Docker compose - Edge Computing - FastAPI - Prometheus - Grafana

Sept. 2022 **Senior Software Engineer (Freelance) @ Context (acquired by IAS)**

Oct. 2022

Tests around the Python Ray framework for its integration in the video stream ingestion service of SaaS Context.

Getting started with Ray, a Python framework dedicated to optimizing available CPU and GPU resources.

- Studying the Ray framework documentation and its various components.
- Setting up a local development environment for Ray.
- Running simple Ray tasks and understanding the resource optimization capabilities of the framework.

Proposal of a simple software architecture around this framework, and integration of a video ingestion pipeline through it.

- Drawing up a simple software architecture that incorporates the Ray framework.
- Implementing a video ingestion pipeline using Ray tasks and actors.
- Testing and debugging the pipeline to ensure efficient video stream processing.

Improvement of 'code quality' tools on an internal library (integration of type-checking, linting, and automatic formatting via hooks and Github Actions).

- Integrating pylint and mypy for linting and type checking.
- Setting up pre-commit hooks for automatic code formatting using black.
- Configuring Github Actions to run the code quality tools on each commit.

Implementation of poetry (Python package manager) on existing services to improve their dependency management.

- Installation and configuration of poetry on existing services.
- Migration of existing dependencies to poetry's pyproject.toml file.
- Testing the build and deployment process with poetry.

*MLOps - Ray Framework - TensorFlow - PyTorch - Python - Poetry - Github Actions -
Video Streaming - Docker - Amazon Web Services - Kubernetes - FastAPI*

Feb. 2021
July 2022

Software Engineer (Employee) @ Boxy (ex Storelift)

Within the 'Store-AI' team, design and improvement of applications for the 'Boxy' store: a fully autonomous connected store.

Updating Boxy applications for better monitoring of store-related events (customer entry-exit, product pickup, etc).

- Upgrading existing applications to include real-time event tracking features.
- Implementing new logging and reporting functionality to monitor customer behaviors.
- Testing and troubleshooting to ensure accurate event tracking.

Adding temperature capture in Boxy and sending the information to our cloud infrastructures.

- Integrating temperature sensors within the store and programming them to capture data.
- Developing and deploying an IoT application to transmit temperature data to cloud-based storage.
- Setting up data visualization tools for temperature monitoring.

Design of Boxy v2: design of the new microservices architecture, use of robust technologies, upgrading the architecture to a solution more in line with existing standards.

- Planning and designing a new microservices architecture for Boxy v2.
- Selecting and integrating robust technologies to support the new architecture.
- Redesigning and upgrading the architecture to align with current industry standards.

Setting up 'code quality check' procedures for Python applications: linting, formatting, unit testing, and static type checking (all automated via Gitlab Git-Hooks).

- Implementing code quality tools such as pylint for linting, yapf for formatting, pytest for unit testing, and mypy for static type checking.
- Setting up automated pipelines using GitLab CI/CD to run these checks on every code push.
- Configuring Git-Hooks to trigger these pipelines automatically.

*GitLab - Hooks - CI/CD - IoT - Python - Kubernetes - Fluentd - Kibana - REST API - Arduino
- RaspberryPi - USB Serial - Prometheus - Grafana - RabbitMQ - Microservices - MQTT -
Clean Code - Pytest - Pylint - Yapf - MyPy*

March 2017
Feb. 2021

Software Engineer (Employee) @ Context (acquired by IAS)

Design and development of software solutions around real-time video analysis using deep learning algorithms.

Design and development of an internal tool for creating and managing databases of images and videos.

- Creating a user-friendly interface for uploading and organizing image and video files.
- Implementing a database system for efficient storage and retrieval of media files.
- Developing backend logic for managing media metadata and associated annotations.

Improvement of internal annotation tools, changing the technical stack. Implementation of code review, pair programming sessions, etc.

- Upgrading annotation tools with newer, more efficient technologies.
- Establishing a code review process to maintain code quality and consistency.
- Implementing pair programming sessions to improve team collaboration and problem-solving.

Design and development of the Context product: a REST API for sending videos and receiving analysis (celebrity detections, logos, objects, etc.). API versioning, updating without service interruption.

- Designing and building a robust REST API for video upload and analysis retrieval.
- Implementing API versioning to maintain backward compatibility during updates.
- Ensuring seamless updates with zero downtime using blue-green deployment strategies.

Development of features on the client dashboard: number of videos loaded on the API, various statistics on videos, etc.

- Adding new features to the client dashboard for tracking video uploads and related statistics.
- Enhancing data visualization elements for a more intuitive understanding of video analytics.
- Ensuring seamless communication between the dashboard and the backend API.

Setting up functional tests for the API and dashboard.

- Implementing a suite of functional tests for the API using PyTest.
- Setting up front-end tests for the dashboard using Jest.
- Integrating these tests into the CI/CD pipeline for automated testing on every code commit.

Redesign of the core Context application: the 'Compute' service responsible for loading deep learning models and processing received videos: frame slicing, subsampling, detection, tracking, classification. Transition to a microservices architecture linked to a Kafka messaging service. Solving scalability issues of microservices via Kubernetes + addons.

- Refactoring the 'Compute' service to improve its efficiency and reliability.
- Transitioning the application to a microservices architecture for better scalability and maintainability.
- Integrating with a Kafka messaging service for efficient inter-service communication.
- Deploying the application on a Kubernetes cluster and resolving scalability issues with appropriate Kubernetes addons.

Docker-compose - Jenkins - MLOps - PyTorch - Docker - Python - Amazon Web Services - REST API - TypeScript - Kubernetes - Angular - Django - PostgreSQL - React - Redux - FastAPI - Lambda - EC2 - PyTest - Jest - Kafka

Education

June 2016 **Master 2 @ Pierre and Marie Curie University (Paris VI)**

Image and Sound for Intelligent Systems - With Honors

Haptics - Sense perception, haptic systems

Virtual reality - Virtual environment design, physics management, human-computer interaction.

Pattern recognition - Coding chain, regression, neural networks, SVM, etc.

Image processing - Image descriptors, motion detection and tracking.

Sound processing - SF model, LPC, noise suppression, source localization and separation

Artificial intelligence - Agents, state space search algorithms, planning

June 2015 **Master 1 @ Pierre and Marie Curie University (Paris VI)**

Robotics Engineering and Intelligent Systems - With High Honors

Microcontrollers - Real-time programming, Timers, GPIO, interrupts, PWM.

Random signals - Random processes, filtering and spectral analysis, detection and estimation.

Information processing - Coding chain, source and channel coding, encryption methods.

Signal processing - Fourier series and transforms, Laplace transform, etc.

C++ programming - OPP basics and language, standard and third-party libraries, etc.

Robotics - Mechanism modeling, kinematics and dynamics, control laws.

June 2014 **Bachelor @ Pierre and Marie Curie University (Paris VI)**

Electronic Engineering - With High Honors

Electronics - Basics of analog and digital electronics, amplifiers, filters.

Measurements - Mastery of measurement devices (oscilloscope, multimeter, function generator).

Computer science - Algorithm basics, data structures, object-oriented programming.

C programming - Language basics, pointers, structures, dynamic allocation.

Mathematics - Analysis, algebra, probabilities, statistics.

Electromagnetism - Electromagnetism basics, wave propagation.

Circuit design - Printed circuit board design, CAD, CAM.

June 2010

Baccalaureate @ Le Corbusier High School (Aubervilliers)

Scientific, Engineering Sciences - Honors

Skills

Backend Development

Expertise in crafting robust REST APIs and microservices using Python 3.xx, with a focus on efficiency and scalability

Python, FastAPI, Docker, Kubernetes

Databases

Comprehensive knowledge of SQL and NoSQL databases, adept at management, design, migrations, and backups to maintain data integrity

PostgreSQL, MongoDB, DynamoDB

DevOps Culture

Embrace DevOps principles, utilizing Docker and Kubernetes for efficient development and deployment, automation, and continuous integration and delivery

Docker, Kubernetes, AWS, Jenkins, Serverless, GitHub Actions, Bash, Gitlab CI

Languages

Multilingual proficiency, capable of communicating effectively in French (native), English (fluent), and Turkish (fluent)

French, English, Turkish

Frontend Development

Proficient in designing and building intuitive web applications and websites using JavaScript and TypeScript, ensuring seamless user experiences

JavaScript, TypeScript, React, Redux, PostCSS, Vite

Machine Learning

Skilled in end-to-end ML pipeline design, data preprocessing, model training, evaluation, and deployment, with a focus on deep learning, computer vision, and NLP

Python, OpenCV, PyTorch, TensorFlow, scikit-learn, Keras

Code Quality

Commitment to writing clean, maintainable, and scalable code, following best practices, SOLID principles, and design patterns. Experience with code reviews, testing methodologies, and refactoring

Clean Code, SOLID, TDD, DDD, Design Patterns, Refactoring, etc.