# Yigit Bezek

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## Employment

### Software Developer (AI Prototyping) 2024 – 2025

*PSA International, Belgium*

- Designed and implemented a multi-agent AI assistant using LangChain (agent-based architecture) with GPT-4 / GPT-3.5, integrating internal documentation, training materials, and structured knowledge sources for a workforce of **approximately 10,000** port workers.
- Engineered three specialized agents, including a psychological analyzer (stress, intent, tone), a learning recommender (personalized upskilling suggestions), and a report generator (automated summaries and insights for supervisors).
- Optimized prompts and agent toolchains, achieving an estimated **25% improvement** in response consistency while reducing irrelevant outputs and accelerating iteration of new AI behaviors.
- Collaborated closely with a senior developer in an Agile, iterative development environment, refining prompts, toolchains, and user flows based on stakeholder feedback, contributing to an estimated **4 hours/week** reduction in manual analysis and support effort.

### Software Developer & Operations 2023 – 2024

*Homemade B.V., Netherlands*

- Developed automation tools including an AI call bot and secretary assistant.
- Managed marketing operations across Google Ads, Meta Ads, and TikTok Ads campaigns.
- Led on-site food festival operations and coordinated the team during CEO absence.
- Designed and executed marketing strategies combining physical advertising and digital funnels.
- Built workflow automations using Zapier and n8n to reduce manual workloads.

## Selected Technical Projects

### AI Facility Layout Optimizer (Thesis) 2024 – 2025

*Hybrid GA-based layout search with discrete-event simulation*

- Developed a hybrid GA-based facility layout generation system integrated with discrete-event simulation (SimPy), achieving **15–30% higher throughput** and **20–35% lower transport distances** compared to manually designed layouts.
- Revived a non-functional industrial simulator by refactoring and rebuilding it using SimPy, enabling automated evaluation of **1,000** layout configurations and forming the backbone of the optimization pipeline.
- Implemented A* pathfinding for obstacle-aware transport routing and designed a modular GA + A* + DES architecture with JSON-based layout seeds and a CRISP-DM methodology, improving travel-time estimation by **10–20%**, reducing manual design time by **60%**, and exploring **5,000** layout variants.

### Computer Vision Haptic Climbing Assistant 2024

*ESP32 wearable haptics + camera tracking*

- Implemented a real-time computer vision pipeline using OpenCV, combining color-based segmentation and contour detection for route identification with keypoint-based tracking to estimate climber position, achieving an end-to-end latency of **150–250 ms**.
- Achieved **80–90%** route detection accuracy under controlled lighting conditions and validated a wearable haptic feedback system providing directional vibration cues (left/right/up) during climbing sessions.
- Designed and integrated a wearable haptic guidance system using an ESP32 with **4** vibration modules, enabling real-time, low-latency feedback and reducing visual checking by an estimated **30%** across **5** climbing routes.

### Smart Bike Theft Defense System (IoT) 2021

*Ultrasonic radar, IMU, capacitive sensing*

- Designed and implemented a low-power embedded theft detection system using ultrasonic, capacitive, and IMU sensors, delivering Bluetooth alerts to a phone interface with sensor fusion and edge decision-making, achieving **2–4 days** of battery life.
- Integrated an ultrasonic radar with a **0.2–4.0 m** scanning range, capacitive touch sensing for direct contact detection, and IMU-based motion detection on an Arduino-class microcontroller.
- Implemented Bluetooth-based real-time alerts with a **200–500 ms** sensor-to-notification latency and reduced false positives to **below 10%** through threshold tuning, temporal filtering, and multi-sensor fusion.

### Interactive Fortune-Teller Robot & Installations 2018 – 2023

*Kinect + projection + narrative interaction*

- Designed and deployed interactive installations, including a fortune-teller robot and a gambling-loss visualization machine, engaging dozens to hundreds of users per installation run.
- Engineered the fortune-teller robot's perception stack using Kinect-based depth sensing and skeletal tracking, maintaining an average interaction time of **1–3 minutes per user**.
- Developed rule-based AI and state machines to interpret user presence and gestures in real time, triggering adaptive narrative responses and achieving an estimated **40%** repeat interaction rate.

## Technical Skills

**Programming**
Python (Advanced), JavaScript (Basic), C/C++ (Exposure), Basic SQL

**AI & Algorithms**
Genetic Algorithms (GA/NSGA-II), A* search, multi-agent systems, basic ML/CV (PyTorch, OpenCV)

**Embedded & Hardware**
Arduino, ESP32, sensors (IMU, ultrasonic, capacitive), actuators, BLE/serial communication

**Tools & Frameworks**
LangChain, SimPy, NumPy, Pandas, SciPy, Processing, Kinect, Zapier, n8n, OpenCV

## Languages

**Turkish** – Native
**English** – Fluent
**Dutch** – Intermediate

## Education

**BSc Creative Technology**
2021–2025 | University of Twente, NL

**BSc Computing Science**
2019–2020 | University of Groningen, NL
(Incomplete)

**International Baccalaureate**
2014–2019 | Tarsus American College, TR
HL: Math, Physics, English

## Summer Schools

**University of Cambridge**
Two months | Cambridge, UK
Physics, CS, Engineering

**University of Oxford**
Two months | Oxford, UK
Human Sciences, Politics

## Other Experience

**Siemens Healthineers** (2022) – Technical Intern
**Mercedes-Benz** (2021) – Workshop Intern
**Alzheimer Society** (2020) – Volunteer
**Ozsut Restaurant** (2019) – Service Staff