

# Jacob Valdez

*AI systems & full-stack engineer*

Agent infrastructure, full-stack AI products, and the runtime glue that turns research ideas into shipped software.

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## HIGHLIGHTS

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- Architected production integration surfaces for mobile and web clients at AGI, Inc.
- Building VibeStartup, an end-to-end platform for spinning up startups (planning, code, infra, growth) on top of agent workflows.
- Authored a wide technical archive (ML systems, agents, multi-agent networks, consciousness, dev platforms) backing each project.

## SKILLS

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AI agents, agent runtime, tool use, schemas, evals, TypeScript, Next.js, React, Python, FastAPI, iOS, on-device LLMs, model quantization, multimodal pipelines, Postgres, Redis, Vercel, Cloudflare, Modal, research synthesis, technical writing, rapid prototyping

## EXPERIENCE

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- Jan 2026 – Apr 2026 **API / Integration Architect** · AGI, Inc.  
Owned the integration surface across API, SDKs, and partner-facing edges — iOS, on-device LLMs, model quantization, agent control plane. Led schema + integration work through fast product pivots.  
agents · ios · on-device · schemas
- Oct 2025 – Jan 2026 **Software Engineer** · AGI, Inc.  
Infrastructure for AGI — agent runtime, mobile glue, eval tooling. Promoted into the integration architect role.  
agents · infra · mobile
- Apr 2025 – Oct 2025 **Software Engineer** · Breezy  
Voice-AI automation product — agent workflows, conversational interfaces, integration plumbing.  
voice-ai · agents
- Sep 2024 – Dec 2024 **Applied ML Engineer (Intern)** · Deepshard  
The Truffle computer — large-model experimentation, multi-agent research, on-device inference tooling.  
ml · on-device · research
- Jun 2024 **Full-Stack Pipeline Engineer** · FLORA  
Generative-AI creative pipeline — TypeScript, Python, Modal, fal.ai, ComfyUI, diffusion models, serverless Next.js front end.  
generative-ai · diffusion · full-stack
- Aug 2022 – Jan 2023 **Software Engineer** · Motio, Inc.  
Develop Soterre for Qlik Sense.  
java · hibernate
- Jun 2022 – Aug 2022 **Software Engineer (Intern)** · Motio, Inc.  
Develop Soterre for Qlik Sense.  
java · hibernate
- Jun 2021 – May 2022 **Software Developer** · IT Lab · UT Arlington  
Evolved and tested CoWiz, a Flask-based statistical visualization tool, and built MLN-Dashboard, a full-stack web server on a Next/React/GraphQL stack.  
react · next.js · graphql · flask

Jun 2021 – May 2022

**Software Developer** · College of Social Work · UT Arlington

Maintained and enhanced MyAmble, a multi-platform (iOS + Android) data-collection app, plus its web admin interface, using Flutter and Firebase.

flutter · firebase · mobile

2020 – 2022

**B.S., Computer Science** · The University of Texas at Arlington

CS coursework alongside heavy lab work, independent ML/robotics prototypes, and a steady research output. GPA 3.6/4.0.

education · cs

2016 – 2018

**A.A.S., Mathematics** · Navarro College

Math associate degree taken dual-credit during high school. GPA 3.9/4.0.

education · math

## PROJECTS

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### SOFTWARE & AI — FOCUS

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| May 2026 | <b>Microscope Viewer</b> — electron viewer that streams a non-UVC usb microscope by driving its vendor-specific supercamera protocol over a small python usb bridge. electron, python, usb, jpeg streaming, hardware.  | Mar 2025 | <b>bsbr</b> — novel attention mechanism for near-linear processing of long sequences in transformers, using chunk-based attention with block retrieval. python, pytorch, transformers, research.   |
| May 2026 | <b>ESP32-S3 USB Webcam</b> — firmware that makes a seeed xiao esp32s3 sense enumerate as a standard usb video class webcam streaming mjpeg over native usb, seen on linux as a normal /dev/video node. esp-idf, platformio, c, usb uvc, embedded hardware.   | May 2023 | <b>The Agent Suite</b> — voice ai agents and business automations for inbound calls, lead qualification, appointment booking, and operations. python, fastapi, supabase, postgres, sqlmodel, pydantic, stripe, react native, expo.                                 |
| May 2026 | <b>Bonk</b> — electron desktop pet that watches your active window and nudges you back to your goals when you drift. electron, javascript, openai, anthropic, hackathon project.   | May 2022 | <b>Node Tree</b> — python toolkit for programming tree-shaped generative processes that render natural-language descriptions and execute matching environment demonstrations, for synthetic demo-description data. python, context-free grammars, agents, tooling. |
| May 2026 | <b>yt2ctx</b> — youtube-to-context compiler that turns reference videos into transcripts, representative frames, style bibles, shot specs, agent prompts, and zip artifacts. next.js, react, typescript, openai, yt-dlp, ffmpeg, vercel blob, postgres, mcp. | Apr 2022 | <b>TensorCode</b> — framework for encoding/decoding arbitrary python objects with differentiable programming and runtime code generation — programming 2.0. python, pytorch, differentiable programming.   |
| May 2026 | <b>notion-vibestartup</b> — business operating system that creates notion dashboards to help 'vibestartups' launch quickly. oauth notion integration, vite, vercel, hackathon project.   | Jan 2022 | <b>MPNets</b> — graph-based neural architecture experiment for training one policy across supervised, self-supervised, unsupervised, reinforcement, hebbian, feedback, and structural learning signals. python, graph executor, research.                          |
| May 2026 | <b>macos-web-next</b> — browser-based macOS desktop simulation built as an instrumentable environment for computer-use agent training, forked from macos-web. svelte, vercel, html2canvas, computer-use agents.  | Oct 2021 | <b>MLN-Dashboard</b> — modular server for data visualization, built and architected as a research assistant. typescript, react, next.js, graphql, prisma, strapi, research assistant role.   |
| May 2026 | <b>Chem-0</b> — prototype autonomous chemistry lab where an AI agent operates a low-cost robot arm via a camera loop and evented measurement stack. lerobot so-101, python, opencv, placo, yolo, mcp, typescript, electron, robotics.                        | Sep 2021 | <b>jnumpy</b> — from-scratch autograd and deep-learning library built for coursework that bans third-party frameworks, later extended with connect-4 reinforcement learning. python, numpy, autograd, school project.  |
| May 2026 | <b>Trash Sorter</b> — robotic trash-sorting prototype covering arm calibration, teleoperation, perception, and grasp tuning. lerobot, so101 arm, computer vision, robotics, hackathon project.   | Jun 2021 | <b>Dash</b> — covid-19 data visualization dashboard built as a web developer on the project team. python, pandas, flask, data visualization.   |
| Apr 2026 | <b>personal site</b> — personal portfolio site where every artifact is a node in a navigable graph over one url space. next.js, mdx, force-directed graph, vercel.   | Jun 2021 | <b>20Q</b> — android 20-questions guessing game built by a 4-person team. java, kotlin, sqlite, android, school project.   |

- Apr 2026 **Lunar Rover** — lunar rover prototype that collects regolith using a four-node autonomous control stack with remote viewer, ground control, satellite relay, and robot control. robotics, llm route planning, mars robots, robo-hacks at y combinator, hackathon project.
- Apr 2026 **canvas-engineering** — a type system for multimodal latent dynamics that turns frozen video diffusion backbones into structured world-modeling substrates via declared latent regions and looped attention. python, diffusion transformers, world models, research.
- Mar 2026 **brain-model / Resonance** — cortical dynamics and affect-geometry project that generates algorithmic music toward a six-dimensional affect target. python, pretty\_midi, fluidsynth, eeg, research.
- Mar 2026 **belief-graph-orchestrator** — event-sourced multi-scale cognitive control system for autonomous gui agents, where belief is a projection over an event log. python, event sourcing, research.
- Mar 2026 **Recursive Omnimodal Video Action Model** — research on looped attention and spatiotemporal canvas layouts for video-action diffusion models, validated across 26 experiments and a cogvideox-2b robot-video graft. pytorch, diffusers, cogvideox, mujoco, robotics, research.
- Feb 2026 **ascii-art** — browser-native multi-layer ascii art generator with per-layer palettes and blend modes. typescript, floyd-steinberg dithering, sobel edge detection, vercel.
- Feb 2026 **standup-ai** — ai scrum-lead agent that reads notion and linear, drafts per-person standup summaries, flags blockers, and writes follow-up tasks back. typescript, notion api, linear api, vercel.
- Feb 2026 **windows-web-next** — browser-based windows 11 simulation with window manager, virtual filesystem, and bundled apps for human annotation and computer-use agent research. svelte, typescript, vercel.
- Feb 2026 **The Tensor Computer** — complete von neumann computer rebuilt as differentiable tensor operations so machine-code programs can in principle be learned by gradient descent. python, jax, differentiable programming, research.
- Feb 2026 **general-unified-world-modeling** — typed causal ontology of civilization that projects economics, politics, firms, people, and events onto one structured latent world model with 857 fields for cross-domain forecasting. python, world models, structured latent inference, research.
- Jan 2026 **precisionBOM** — ai-assisted bom sourcing tool with live digikey inventory, price breaks, alternates, and export paths. next.js, python multi-agent service, digikey api, hardware procurement, hackathon project.
- Dec 2025 **lifelogger** — personal activity-tracking daemon that ingests local signals and runs batched llm summarization on hourly, daily, and weekly cadences. python, llms, local-first storage.
- May 2021 **multigraph-nn** — experiment for recurrent neural networks whose state is stored in typed, dynamically updated graphs with learnable edges and adjacency. tensorflow, keras, python, research.
- Apr 2021 **Stanford Open Datathon Group Project** — datathon research project analyzing covid vaccine misinformation and twitter sentiment via clustering of bert tweet embeddings. python, bert, k-means, hypertools, 5-person group project.
- Mar 2021 **jplotlib** — small matplotlib helper that lays out many generated images in a grid for research notebooks. python, matplotlib, setuptools, pip package.
- Mar 2021 **tf-som** — tensorflow keras layers implementing locally competitive, self-organizing-map-style unsupervised feature learning, in dense and convolutional variants. python, tensorflow, keras, pypi package.
- Jan 2021 **DesparadosAEye** — on-device android chatbot that ports facebook's blenderbot-small to tflite so a 335M-parameter model runs without a cloud backend. kotlin, java, sqlite, android, tensorflow lite, blenderbot, school project.
- Sep 2020 **multi-graph-former** — experiment recasting transformer attention as graph neural network message passing, generalizing seq2seq into graph2graph with learned edge state. tensorflow, keras, python, research.
- Apr 2020 **Home Internet Factory** — internet-connected prototyping hub where a raspberry pi gateway drives a tabletop cnc router, 3d printer, cameras, and 3.3V logic i/o. raspberry pi 4, cnc, 3d printing, diy hardware.
- Jul 2019 **Workplace Surveillance System** — computer vision system that detects employees on their phones in the workplace. tensorflow.js, mobilenet, javascript, web.
- Oct 2016 **SQTEST** — rule-based english-spanish translator handling past and present tense in both directions, formalizing verb conjugation and agreement rules. c#, visual studio, school project.
- Oct 2016 **Labatron** — automated stoichiometry solver that takes a chemical equation and outputs fully worked-out work as a csv, for chem 1411/12. c#, visual studio, school project.
- Oct 2015 **Sale** — basic spanish-english translation system using formal language parsing and a production system. c#, visual studio, school project.
- Jun 2015 **Space Pong** — two-player pong-style game in a space-themed arena with local keyboard controls. blender game engine, python, game.
- Mar 2015 **Cookie Cutter CNC** — full-stack 36x36 sheet-metal CNC cutter with c# svg parser and toolpath scheduler plus an arduino client over a serial protocol. c#, arduino, svg parsing, electronics, diy hardware, school project.
- Sep 2014 **Copyright Calculator** — scripted conversation web app that queries students to determine whether reused material qualifies for fair use. html, css, javascript, google sites, group school project.

- Nov 2025 **browser-os** — generic browser-native desktop shell with window manager, virtual filesystem, and app life-cycle that the windows-web-next and macos-web-next simulators inherit from. typescript, svelte, vercel.
- May 2025 **imgpt** — python cli for generating openai images from single prompts or whole prompt directories, with persisted defaults, model controls, and cost-aware batch behavior. python, openai sdk, typer, rich, pydantic, poetry, pypi.

## ADJACENT WORK

- Nov 2025 **eggroll-trainer** — python implementation of the EGGROLL low-rank evolution-strategies algorithm for training billion-parameter models without gradients. python, pytorch, evolution strategies.
- Sep 2024 **Tiles** — free and open source browser matching game where you pair tiles by shape or color, with tunable difficulty and combo scoring. html, css, javascript, no build step.
- May 2023 **Jacob's Hits 2023 (album)** — self-produced album of original songs released as a personal project. music production, soundcloud.
- Jun 2022 **AI Proverbs** — proof-of-concept site of AI-generated proverbs with text and images, exploring creative potential of ML models. gpt-3, jekyll, render.com.
- Oct 2021 **The Multi-Agent Network (MAN)** — modular framework for fusing pretrained foundation models with self-organising learning agents on a shared, typed workspace. python, salina, pytorch, deep learning, research.
- Oct 2021 **The Fertile Crescent** — umbrella ecosystem of repos and libraries advancing ai agents, including computatrum, the multi-agent network, tensorcode, and node-tree. python, deep learning, research.
- Sep 2021 **Broadening and Building Beyond Classical Reinforcement Learning** — conference poster applying broaden-and-build theory of positive emotions to a multi-agent deep reinforcement learning architecture. reinforcement learning, multi-agent, affective psychology, school project.
- Aug 2021 **Summer Break 2021! (album)** — first music album, a set of original songs written over the 2021 summer break and later released publicly. music production, soundcloud, personal project.
- Mar 2021 **Predictive General Intelligence** — theoretical framework and plan for developing artificial general intelligence, written up as a paper and presentation. research, school project.
- Feb 2019 **Full Stack Artificial Intelligence** — research proposal for human-level AI via unsupervised GLOM-style agents that each control a sandboxed linux vm and evolve under artificial selection on information tasks. python, tensorflow, deep reinforcement learning, research.
- Feb 2019 **Computatrum** — project to develop teachable yet autonomous open-ended computer-interaction agents. python, ai agents, computer-use agents.
- 2019 **Limboid** — hydraulic, musculoskeletal humanoid robot built around cheap artificial-muscle actuation — a long-horizon low-cost embodied-ai bet. 3d printing, cnc, pcb fab, hydraulics, control.
- Mar 2017 **Polonius as a Fool** — animation of two scenes from shakespeare's hamlet, reading polonius as a comic fool. animation, school project.
- Oct 2014 **Dolphin Rocket** — 9th-grade bottle-rocket engineering campaign documented as a mini-documentary, iterating to the finned Dolphin 5 design and a payload recovery launch. bottle rockets, diy hardware, videography, school project.
- May 2014 **The Right Night Light** — short 3d animation following a monkey searching for the right night light to cross the ground. blender, animation, school project.
- Dec 2013 **Looking for Princess Suzzane** — blender animation made to teach conjugation of spanish -AR verbs through a short narrative. blender, 3d animation, spanish, school project.
- Mar 2013 **Cookie Baker 3D Printer** — programmable 12x12 2D gantry built as an attempted 3D printer (extruder never added). arduino, c#, svg parsing, stepper motors, diy hardware, school project.