arinupadhyay.cs@gmail.com
+48 571-525-306
Kraków, Poland
Eligible to work in Poland
GITHUB: https://github.com/shinymonitor

Arin Upadhyay

Embedded Systems & Low-Level C Developer

- Specialized in developing performant, heap-less, and reliable software in C and Zig for resource-constrained environments.
- Proven ability to design and implement secure communication protocols (EFPIX) and efficient machine learning models for edge devices (QMTIK).
- Deeply passionate about systems programming, memory optimization, and building robust software from the ground up.

SKILLS

Languages: C, Zig, Python, Assembly
Domains: Embedded Systems, Low-Level & Systems Programming, Secure Protocol Design, Cryptography, Real-Time Systems.
Tools: GCC, Clang, Make, GDB, Valgrind, Git, Linux.
Hardware & Protocols: SPI, I2C, UART, GPIO, PWM, ADC, ARM Cortex-M

PROJECTS

EFPIX (Encrypted Flood Protocol for Information eXchange) [here]
A zero-trust, encrypted flood-based relay communication protocol designed for privacy, resilience, and metadata protection. It enables end-to-end encryption, plausible deniability, and untraceable messaging, even in hostile or degraded network environments.
[Whitepaper, Protocol Design, LaTeX, Peer-to-peer networking, Cryptography, Embedded systems]

QMTIK (Quantized Model Training and Inference Kit) [here]
A minimal, lightweight and dependency-free implementation of a quantized neural network designed for embedded systems and resource constrained environments. It uses 8-bit integer quantization for both weights and activations, enabling efficient inference on microcontrollers and edge devices for real-time applications. It can achieve **4x smaller model size, 2-4x faster inference**, and minimal, if not none, accuracy loss.
[C, Low-level programming, AI/ML, Embedded systems, Memory Optimization]

Cazpyr [here]
A heap-less, lightweight, and dependency-free terminal-based text editor with a fixed memory footprint, designed for maximum predictability and performance. It supports common key bindings, window size adapting, custom colors and build and run shortcuts.
[C, Low-level programming]

Heapless Zig RSA [here]
A single-file, **zero-allocation** library for RSA encryption and signatures in Zig with OAEP+ padding using hashing function from standard library
[Zig, Low-level programming, Cryptography]

NCT (NiCeTy) [here]
It is a lightweight command-line project manager for C projects. It helps you quickly initialize, build, test, and run C projects with a simple configuration system.
[C, Tooling]

FAST3SAT [here]
A deterministic solver for a subset of 3SAT problems using frequency-based greedy variable assignment for efficient solution discovery.
[C, Python, Algorithms]

EXPERIENCE

Protocol Designer & Whitepaper Author, *AstroDevelopers (AGH University Club)*
Designed and specified EFPIX, a novel zero-trust communication protocol for resilient messaging in hostile environments.

Head of Game Development, *GIIS Tech Club (Singapore)*
Led and judged game development submissions at a tech hackathon.

AI/ML Trainee, *AIYA (Corporate Gurukul) [Sep 2021-May 2022]*
Completed a competitive corporate course on AI/ML applications, achieving 2nd place in the final project competition.

Volunteer Marketing and Technical Assistant, *4s NGO*
Volunteered as Marketing and Technical Assistant and prepared marketing material and edited videos including animation and video production.

EDUCATION

AGH University of Science and Technology [Oct 2023-Expected 2027]
Bachelor of Computer Science (English)

GIIS Smart Campus (Punggol), Singapore [Oct 2021-Mar 2023]
Awarded a full scholarship for CBSE 11 & 12 (GIIS Smart Campus, Singapore).

LANGUAGES

English: C1 (IELTS)
Polish: A1 and avid learner
Hindi: Native
German: Intermediate