Erfan **Khadem**

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An Electrical Engineering student looking for research oppurtunities

Education

Bachelors of Science in Electrical Engineering — *2022 - 2026*
Sharif University of Technolog — *Tehran, Iran*

- Courses: Realtime Embedded Systems | Operating Systems | Cryptography | Advanced Programming

Highschool Diploma in Physics and Mathematics — *2019 - 2022*
Dastgheib 1 Highschool of Shiraz — *Shiraz, Iran*

- Shahid Dastgheib 1 highschool is under the supervision of NODET, National Organization for Development of Exceptional Talents, and is the most prestigious highschool in south of Iran

Professional Experience

Embedded Hardware and Backend Developer — *2023 - Present*
Home Automation Project at National Elites Foundation — *Tehran, Iran*

- Lead a team of computer security experts, electrical engineers and developers to build home automation appliances and smart gateways using TI's Zigbee chips and Espressif System's ESP32 and ESP8266 microcontroller series
- Guide our team to implement Test-Driven Development practices and integrate solutions produced by other teams in our product.
- Coordinate efforts between our team members and set goals and deadlines according to our timeline.
- Technologies:
  - FreeRTOS
  - Websocket
  - Nodejs
  - Embedded Linux
  - Svelte

Fullstack Developer and Systems Administrator — *2022 - 2023*
Abarkelas — *Tehran, Iran*

- Develop Django backend using django-rest-framework
- Fix bugs and improve UX at our frontend using SSR and Vue.js
- Improve monitoring and alerting for our backend systems
- Implement self-healing procedures for our backend systems
- A/B test our user base to guide our product development process
- Technologies:
  - Django REST Framework
  - Vue.js
  - Docker
  - Redis
  - Postgres
  - Grafana + Prometheus

Fullstack Developer and Systems Administrator — *2020 - 2022*
Niroutrans Co. — *Shiraz, Iran*

- Complete development of an advanced monitoring system for Niroutrans' solar power plant, the biggest roof-mounted solar power plant in Iran
- Design advanced data visualization for our power plant monitoring system
- Design and implement online product documentation center to improve our customers' experience
- Technologies:
  - Microsoft SQL Server
  - Redis
  - Bootstrap 4 & 5
  - Modbus TCP
  - Protobuf
  - Nginx

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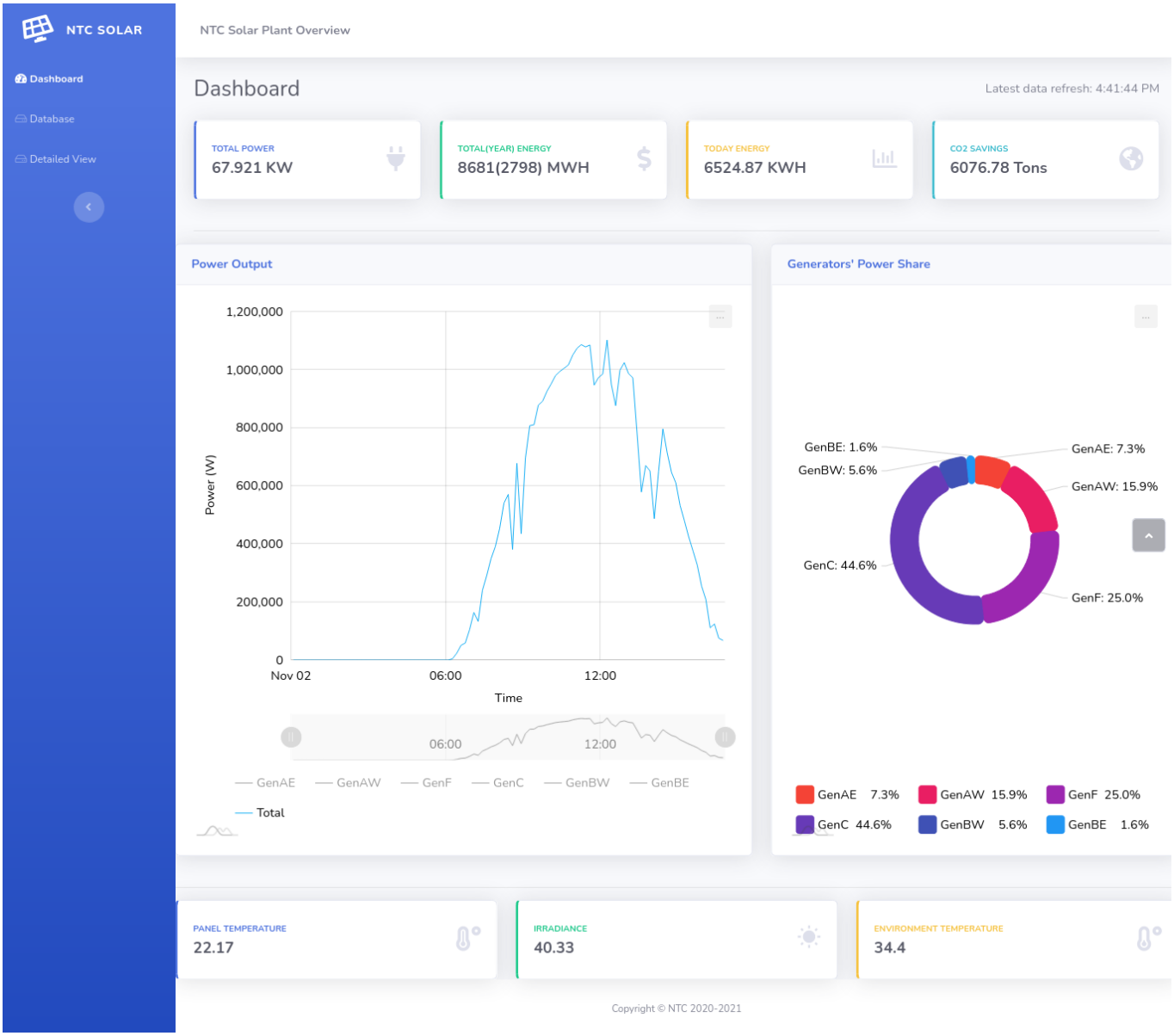
- 
NTC SOLAR
NTC Solar Plant Overview
Dashboard
Database
Detailed View
Dashboard
Latest data refresh: 4:41:44 PM
TOTAL POWER
67.921 KW
TOTAL(YEAR) ENERGY
8681(2798) MWH
TODAY ENERGY
6524.87 KWH
CO2 SAVINGS
6076.78 Tons
Power Output
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
Power (W)
Nov 02
06:00
12:00
Time
GenAE
GenAW
GenF
GenC
GenBW
GenBE
Total
Generators' Power Share
GenBE: 1.6%
GenBW: 5.6%
GenAE: 7.3%
GenAW: 15.9%
GenC: 44.6%
GenF: 25.0%
GenAE 7.3%
GenAW 15.9%
GenF 25.0%
GenC 44.6%
GenBW 5.6%
GenBE 1.6%
PANEL TEMPERATURE
22.17
IRRADIANCE
40.33
ENVIRONMENT TEMPERATURE
34.4
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Projects & Associations

Advanced Algorithms in Rust

2022

TheAlgorithms/Rust

Github

- Implement advanced graph algorithms such as centroid decomposition and max-flow.
- Implement various cryptographic algorithms including Salsa20 and HMAC.
- Improve and optimize the implementation of various algorithms like SHA256 and DSU.
- Various other improvments and implementation.

Jungle Marble Blast Clone

2023

er888kh/bp-cpp

Github

- This was the project for our basic-programming course.
- Implemented using SDL and Dear ImGui libraries in C++.
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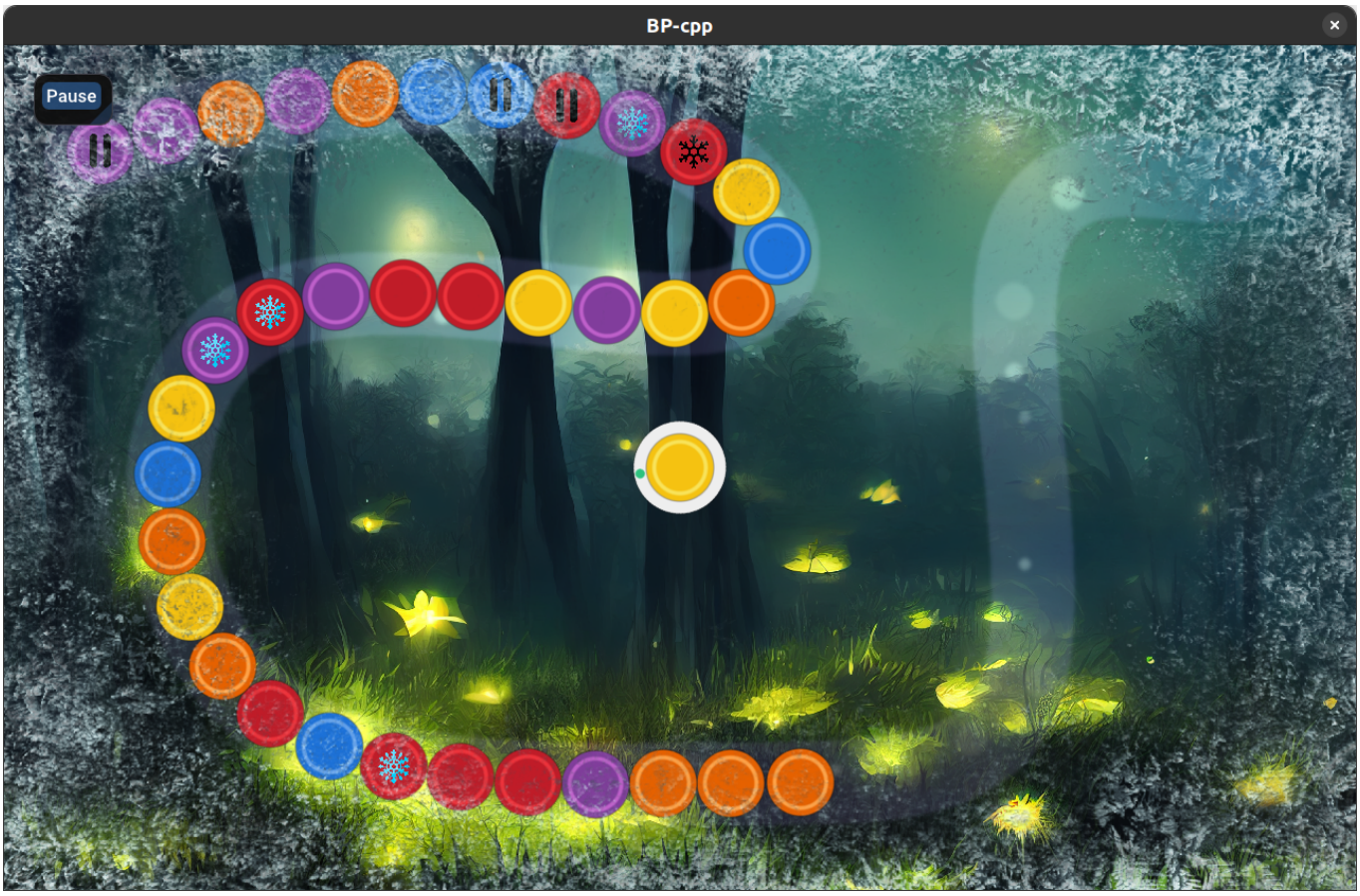


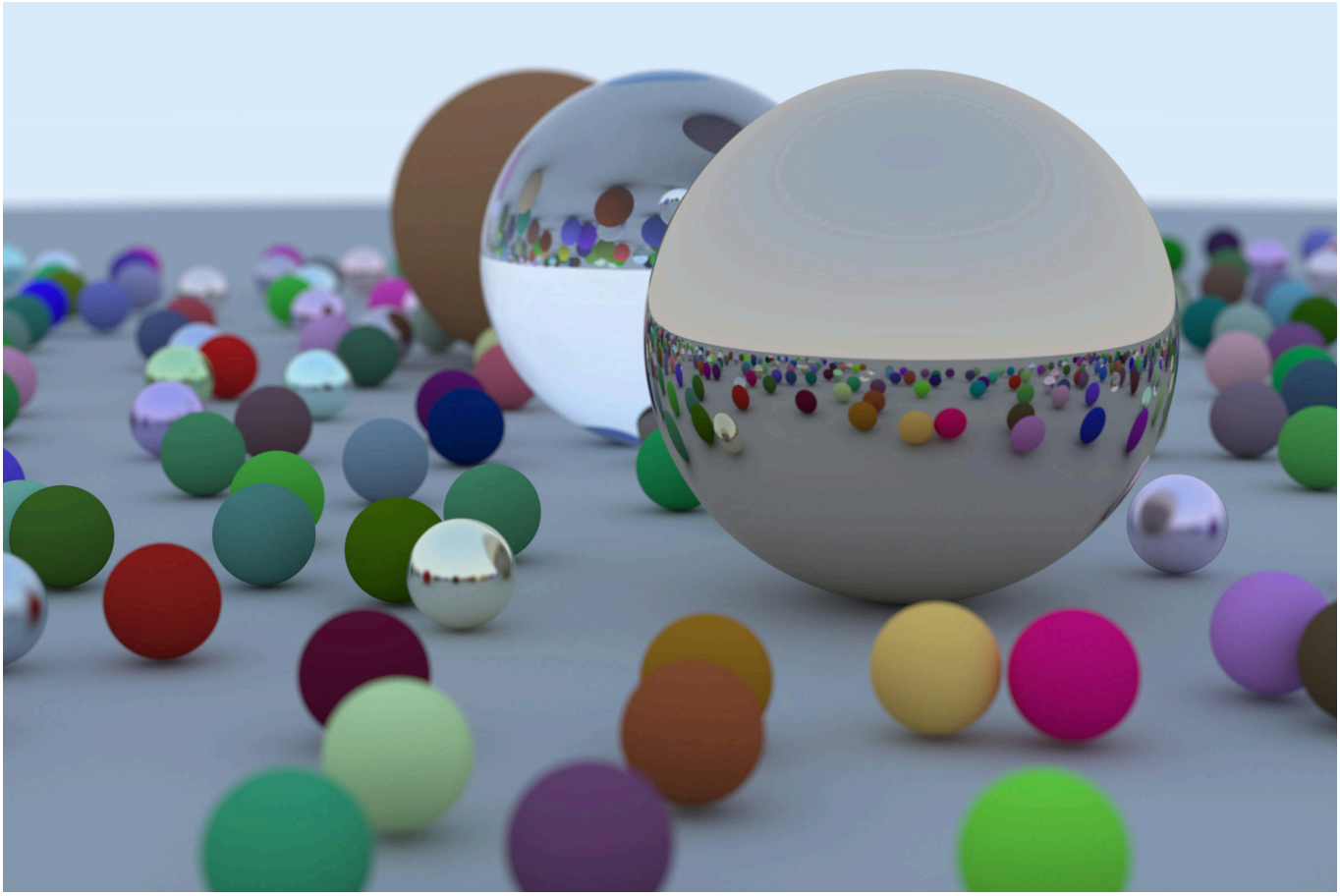
Path Tracing Tay-Tracer

2022

er888kh/ptrt

Github

- A simple path tracer implemented in pure C++.
- Using various statistical and SIMD tricks to improve performance
- Parallel processing implemented using OpenMP



SSH VPN with User Management *2023*

er888kh/SSH-Liberty-Bridge *Github*

- Implemented in go with the user management componenet written in python.
- Has been used successfully for bypassing GFW restrictions in Iran and bringing internet freedom to the citizens.
- Integrated in hiddify's excellent GFW bypass solution.
- This has been implemented with great care regarding its security and performance and uses redis as its database

Certificates

2021 **Scientific Computing with Python**, Free Code Camp
2021 **Responsive Web Design**, Free Code Camp
2021 **Javascript Algorithms and Data Structures**, Free Code Camp

Skills

Languages English | Persian | Arabic (basic)
Tech Stack JS (Svelte/Vue.js) | Python (Pandas/Numpy/Django) | Rust | Go | C/C++ (HW/RTOS/Linux)
Hobbies Mathematics | Cryptography | Bicycle | Electronics