Ioan Dragomir

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Bd. Vasile Milea, Bucharest, Romania / Complex Studențesc Observator, Cluj-Napoca, Romania

Proficient developer and sysadmin with a great passion for **low-level systems** and **interdisciplinary engineering.** With 10 years of non-formal programming experience and 5 years of **Capture The Flag contest** participation, I have greatly developed my understanding of high- and low-level, software and hardware systems, learning both how to design and reverse engineer them, as well as how to efficiently make use of available community tools and scripting languages to automate my workflow. **Main skills and interests** include:

- Proficiency in Python, C, MATLAB, and Web technologies. Competence in VHDL, C++, Java, and a basic understanding of multiple other programming paradigms. Attention to secure programming practices and producing clean, maintainable code.
- Understanding of low-level computer systems: assembly language, OS internals, various CPU architectures, high- and low-level emulation, low-level optimizations.
- Familiarity with modern software and firmware reverse engineering practices and tools: IDA Pro, Ghidra, x64dbg.
- Technical writing, presentation, and teaching skills. Video production to aid teaching.
- Fundamental digital design, electronics, digital signal processing, and control theory knowledge.

Experience

2021 JULY – 2021 SEPTEMBER

Bitdefender – Junior Security Engineer

Worked as part of the Active Threat Control team:

- Wrote malware detection heuristics that run in both user-space and the Windows kernel-space
- Contributed to the internal ATC framework
- Monitored current trends in malware behavior
- Better familiarized myself with programming in a team, learning Jira, git, and the code review process

2021 MARCH – 2021 JUNE

UNbreakable Romania – Cyber security mentor and challenge author

- **Wrote documentation** for various CTF challenge categories meant as guides for beginner players.
- Hosted a webinar on basic **computer networking and the use of tools** such as netcat and pwntools.
- Designed and implemented hackable services for the CTF competition.
- Assisted contestants in learning cyber security by solving tasks from the CyberEdu educational archive.

2019 AUGUST – 2020 JANUARY

Banat IT – HackTM CTF organizer

- Managed an online scoreboard platform for the contest, built on the **LEMP stack**
- Designed and built reverse engineering and binary exploitation exercises, automating many parts of the workflow using **Python**
- Used **docker** to securely set up and orchestrate task servers which the competitors had to hack into
- Grew the event's community on social media

all leading to a flawless qualification round with 747 participating international teams: ctftime.org/event/956

2017 SEPTEMBER – 2019 DECEMBER

European Cyber Security Challenge – Team Romania member

Preparing with the team since 2017, I was among the finalists in 2019, helping my team get to 1st place. Specialized on **static reverse engineering**, I have since achieved great performances in CTF competitions, both solo as "trupples", as well as part of the "WreckTheLine" team (ctftime.org/team/57908), strengthening my **teamwork, organization, and communication skills.**

2019 JANUARY – 2019 JULY

jmp0xc0ffee – Event host, workshop organizer

- **Organized a weekly cyber security club** in affiliation with Security Espresso and Orange FAB.
- **Taught** an introductory course in basic reverse engineering, binary exploitation, and network forensics, taking the form of both **presentations, hands-on workshops, and CTF participation.**

2017 NOVEMBER – 2018 JULY

Creative Motion – Linux sysadmin, web developer

- Maintained company **email, DNS, development servers** for internal projects, and the public-facing web server.
- Implemented the 2018 website using vanilla HTML, CSS, JS

Courses

2022 FEBRUARY – 2022 MAY

Digilent Digital Design Club

As a resolution to my lifelong curiosity about low level system design, I took part in the Digilent Digital Design Club and learned the basics of VHDL, Embedded Linux systems (with Yocto, Petalinux) and the use of Vivado and Vitis.

2021 OCTOBER – 2022 JANUARY

INCDTIM: Basics of Quantum Information

Having some rudimentary understanding of the subject from my personal endeavors, I joined this extra course to better understand the inner workings of quantum computation and got a better grasp of both the theoretical and the practical, experimental aspects of the field.

Awards

- **NSUCRYPTO** – 2020 (10^{th} individual, silver; 8^{th} team, silver), 2021 (3^{rd} individual, bronze; 5^{th} team, silver)
- **DEF CON CTF Finals** – 2021 (8^{th} place), team PTB_WTL
- **Hack-A-Sat Qualifiers** – 2020 (14^{th} place), 2021 (8^{th} place), team OneSmallHackForMan
- **CodeGate Junior CTF 2020 Quals** – 1^{st} place, individual
- **ACS IXIA CTF 2020** – 1^{st} place, individual
- **European Cyber Security Challenge 2019** – 1^{st} place, team Romania
- **National Olympiad in Informatics** – 2012 (silver), 2013, 2014 (bronze), 2015 (silver), 2016 (bronze), 2019

Projects

Oscilloscope vector graphics explorations

In late 2020 I bought an old oscilloscope and experimented with various signal generation techniques to display art on its CRT screen, achieving static images, preprogrammed animations, as well as “live streaming” of animations from a computer, (github.com/trupples/oscilloscope-graphics) and also procedural generation of various fractals. (twitter.com/_trupples/status/1373017992993378308)

CTF Writeups

As a member of the CTF community and being passionate about teaching others, I create both text and video writeups with in-depth explanations of interesting reverse engineering challenges, especially ones which demonstrate **weird custom computing architectures**. These include WPI CTF 2019 “breakingin” (youtu.be/yEbAQXDKRKY) and Google CTF 2020 “sprint”. (youtu.be/jcUK9VRvzbk)

Interactive physics simulations

Also used as the project for my certificate of professional competence, I created **interactive educational software** for my physics class, based on a **custom JavaScript Entity-Component-System framework**, to aid in teaching the Resonance and Chaos theory lessons: (trupples.github.io/projects/rezonanta, trupples.github.io/projects/haos)

Education

2020 SEPTEMBER – 2024 JULY

Technical University of Cluj-Napoca

Bachelor's Degree in Systems Engineering – Automation and Applied Informatics.

2016 SEPTEMBER - 2020 JULY

"Nicolae Iorga" Theoretical High School

English bilingual mathematics and computer science.

High school diploma:

- B2 level English,
- Certificate of professional competence in web development