

# Youssef M. Khafaja

Security Engineer & Mathematician

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## PROFILE

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Cybersecurity engineer and Linux specialist with a strong foundation in mathematics and hands-on experience in penetration testing, CTF methodologies, and secure systems automation. Proficient in C++, Python, and Bash, focused on low-level engineering and building reliable security tooling. Skilled at applying mathematical reasoning to enhance offensive and defensive capabilities. Currently developing advanced security tools, exploring modern cryptography, and contributing to open-source to continuously deepen technical expertise.

## EDUCATION

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### Mansoura University, Egypt

*Bachelor of Science, Mathematics*

2021-2026

- Leveraged a rigorous math foundation to solve complex problems in cybersecurity and cryptography.
- Applied concepts from **Abstract Algebra & Number Theory** to analyze modern encryption protocols.
- Utilized **Graph Theory & Complex Analysis** to model network resilience and algorithmic complexity.
- Led a competitive **CTF team**, coordinating problem-solving and mentoring peers in advanced security challenges.

## EXPERIENCE

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### Self Employed

Remote

*Linux Power User — System Administration & Scripting*

Jun 2022 – Present

- Daily use of Linux (Fedora, Arch, Debian) for development, system administration, and cybersecurity labs.
- Installed, configured, and maintained Linux environments including package management, user administration, and shell scripting.
- Troubleshoot system issues, optimized performance, and configured services (Apache, NGINX, SSH, firewalls).
- Experienced with virtualization (QEMU/KVM), Bash scripting, and remote server management.
- Applied Linux in personal projects, freelance work, and self-learning labs for system security and automation.

### Freelance

On-site

*Maintenance & Repair Specialist – Electrical & HVAC*

Jan 2020 – Present

- Provided maintenance and repair services for household electrical appliances including washing machines, refrigerators.
- Specialized in air conditioning (HVAC) installation, troubleshooting, and periodic maintenance for both residential and commercial clients.
- Diagnosed and fixed electrical faults, replaced defective components, and ensured safe operation of appliances.
- Delivered reliable freelance services, ensuring customer satisfaction and repeat business.

## PROJECTS

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### Alpha Attack — Cuppa CMS LFI

PHP, OWASP ZAP, nmap, John the Ripper, Bash

*Penetration Test / Research Lab*

2025

- Identified and exploited a Local File Inclusion (LFI) vulnerability in Cuppa CMS, achieving remote code execution and full privilege escalation to root.
- Extracted and cracked password hashes using John the Ripper, then leveraged weak sudo configurations to obtain persistent SSH access.
- Designed and documented a reproducible attack chain, including payloads, exploit scripts, and sanitized reporting tailored for vulnerability assessment workflows.

### Personal Portfolio & Technical Blog

Hugo, HTML, CSS, JavaScript

*Frontend Development*

2025

- Built a high-performance portfolio and technical blog using Hugo to showcase cybersecurity projects and research.
- Designed a responsive, accessible UI with modular components and smooth interactive elements.
- Implemented structured content architecture with tagging, categories, and SEO-optimized metadata.
- Achieved fast load times and high Lighthouse scores through optimization and static rendering.
- Applied security-focused development practices and deployed via a secure Netlify pipeline.

## CERTIFICATES

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### Technical Certificates

- Cybersecurity Academy – NTI
- Cybersecurity For Beginners - MaharaTech
- RedHat Certified System Administrator

- Cloud and Virtualization Concepts
- Network Virtualization Concepts
- Qbronze (Quantum Computing Diploma)

## SKILLS

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### Technical Skills

- **Linux Administration** – System management, SELinux, systemd, scripting, monitoring and automation.
- **Networking** – Routing, switching, VLANs, IP addressing, subnetting, NAT, ACLs, troubleshooting.
- **Programming** – Proficient in Python and C++, with additional experience in SQL, HTML, and CSS.
- **Cloud and Virtualization** – Familiar with Docker, Kubernetes, VirtualBox, VMware, and AWS.
- **Version Control Systems** – Skilled with Git, GitLab and GitHub for source code management.
- **Web Servers** – Apache and Nginx setup, configuration, and management.
- **Quantum Computing** – Qiskit programming and contribution to open-source projects.
- **Tools** – Familiar with Vim, LaTeX, Notion, and Obsidian for documentation and workflow optimization.

### Mathematics Skills

• MATLAB	• Calculus	• Network Theory	• Lie algebra
• Maple	• Real Analysis	• Numerical Analysis	• Algebraic Systems
• LaTeX	• Complex Analysis	• Abstract Algebra	• Statistics
• Quantum Mechanics	• Differential Equations	• Linear Algebra	• Probability Theory

### Soft Skills

• Problem-Solving & Analytical Thinking	• Leadership & Team Collaboration
• Continuous Learning & Self-Development	• Adaptability & Flexibility
• Discipline & Commitment	• Creativity & Innovation
• Effective Communication	• Organization & Planning

### Language Skills

- **Arabic** – Native
- **English** – Very good (spoken and written)