IEEE COMPUTER SOCIETY

HACK BATTLE

TRACKS & GUIDELINES

Note:

Each team must select exactly one track. Within that track, teams may choose one or more of its subtracks for their project. The descriptions under each subtrack are meant only as ideas and possible directions i.e. they are not exhaustive or prescriptive. Teams are free to explore any project that aligns with the broader theme of their selected subtrack(s).

Track 1: AI & Automation

The Problem: The great tragedy of artificial intelligence is that we taught rocks to think, and now we exclusively use them to write mediocre apologies to our clients.

The Challenge: Rescue AI from the chat window. Give it hands, memory, and a sense of boundaries so it can actually interact with the real world without needing constant adult supervision.

Subtracks:

- **Agentic Workflows:** Build AI that can plan, trigger external APIs, and execute multi-step tasks autonomously.
- **Self-Learning & Adaptation:** Build models that continuously learn as the underlying data changes, adapting to new patterns and unseen situations without needing to be retrained from scratch.
- **Guardrails & Trust:** Create filters, evaluation harnesses, or honeypots that keep model outputs safe, accurate, and aligned.

IEEE COMPUTER SOCIETY

Track 2: Systems & Infrastructure

The Problem: We romantically call it “the cloud”, but it is merely someone else’s computer, and they are almost certainly overcharging you to keep it running.

The Challenge: Engineer the invisible plumbing. Build tools that make deploying code faster, networks more resilient, or data syncing seamless when the connection inevitably drops.

Subtracks:

- **Cloud & Deployment Automation:** Scripts or platforms that kill manual server management and automate release cycles.
- **Decentralization & Protocols:** Peer-to-peer file sharing, custom network layers, localized communication tools, custom proxies, or tools that keep data flowing when the connection drops.
- **Core Systems & Data Engines:** Lightweight caching systems, fast data synchronizers, custom local storage engines, or OS-level hacks like system utilities and micro-schedulers.

IEEE COMPUTER SOCIETY

Track 3: Developer Tooling

The Problem: To have one browser tab open is a necessity; to have one hundred and fifty is a cry for help. Engineers spend more time fighting their environment than actually building in it.

The Challenge: Build the exact tools you wish you had at 3 AM when your codebase was on fire and your RAM was begging for mercy.

Subtracks:

- **Terminal & Shell Tooling:** Command-line utilities, shell enhancements, scripting frameworks, or custom dev-environment plugins.
- **Codebase Intelligence & Navigation:** Assistants, AI or algorithmic, that help engineers understand and move through large codebases such as dependency mappers, semantic code search, refactoring aids, or repo-wide Q&A tools.
- **Workflow & Context Management:** Build tools that ruthlessly eliminate context-switching. Create workspace orchestrators, smart snippet managers, local automation engines, or whatever keeps you in the zone.

IEEE COMPUTER SOCIETY

Track 4: Cybersecurity & Privacy

The Problem: Privacy is the one thing modern society claims to value above all else, yet we willingly trade it away every morning for a slightly personalized social media feed.

The Challenge: Lock down the digital ecosystem. Protect the user, assume the network is already hostile, or build a spotlight that exposes the invisible data-harvesting machines.

Subtracks:

- **Local-First Privacy:** Build applications where sensitive data never leaves the device such as offline password managers, private AI assistants running entirely on-device, encrypted personal knowledge bases.
- **Defense & Sandboxing:** Systems that assume every application, file, and network is untrusted by default such as browser sandboxing tools, suspicious file detonation environments, permission-aware firewalls, malware analysis sandboxes.
- **Surveillance Transparency:** Browser extensions, local proxies, or analysis tools that expose hidden telemetry, showing the user exactly what a site is harvesting, from shadow cookies to ETag tracking.

IEEE COMPUTER SOCIETY

Track 5: Open Innovation

If none of the other tracks spark your imagination, this is your playground to build something completely new over the weekend. Whether you want to wire up Hardware & IoT, break reality with AR/VR, dive into Web3, craft an immersive new game, or code something delightfully bizarre that defies all categories, this is where your wildest ideas get built. This track has no fixed subtracks and teams are free to choose their own path.