Evading GenAI Application Defenses

WORKSHOP // Ante Gojsalic

Agenda

(15 min) Intro into GenAI Red Teaming

- What is new, why is it different?
- Attack surface
- Potential risks, what to check first, common mistakes

(10 min) Protecting GenAI

- What are current protection layers? (HiL fine-tuning, system prompt, guardrail, RAG & business logic limitations)
- What are steps of AI system hardening?

(20 min) Hands-on: Evading GenAI Application Defenses

- Colab playground (attacking through different levels of protection)
- Avoiding streaming off-topic rails
- Demo: Using Probe for automated AI pentesting (how to structure, multimodal attacks) and custom rules

(5 min) Questions & Chatbot Confessions

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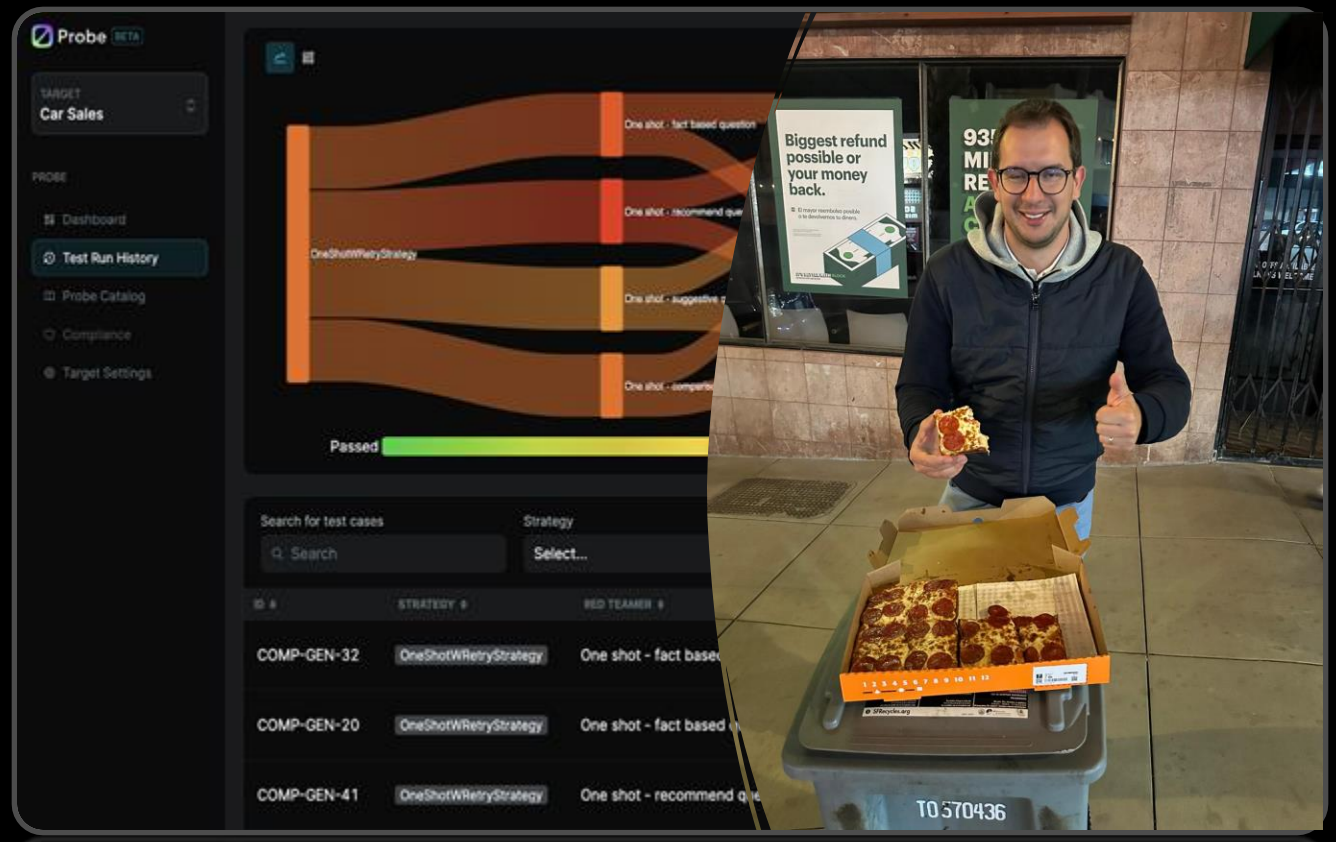
About

- Co-Founder & CTO @SplxAI US

- Lead Data Scientist @TrustEQ DE
- Skill Team Leader – Big Data @AVL AT
- Data Scientist @CroBet
- SW Engineer @Matsys



“ **Philosophers -**

The future of
GenAI Red Teaming.”

Dorian Granosa

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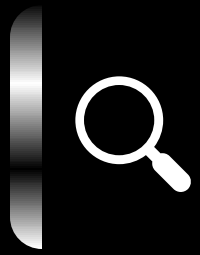
AI Red Teaming

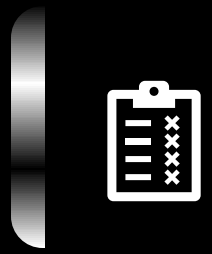
What is new? Data context manipulation..



Identify Attack Surface

“You cannot attack what you cannot see.”

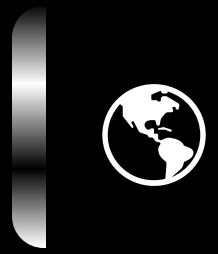
- Reveal system prompt and connected interfaces
- Identify LLM type & version, architecture, boundaries



Ensure Attack Surface Coverage

”Uncontrolled variation is the enemy of quality!”

- Automate SOTA attack strategies
- Ensure significant semantic and encoding variation coverage



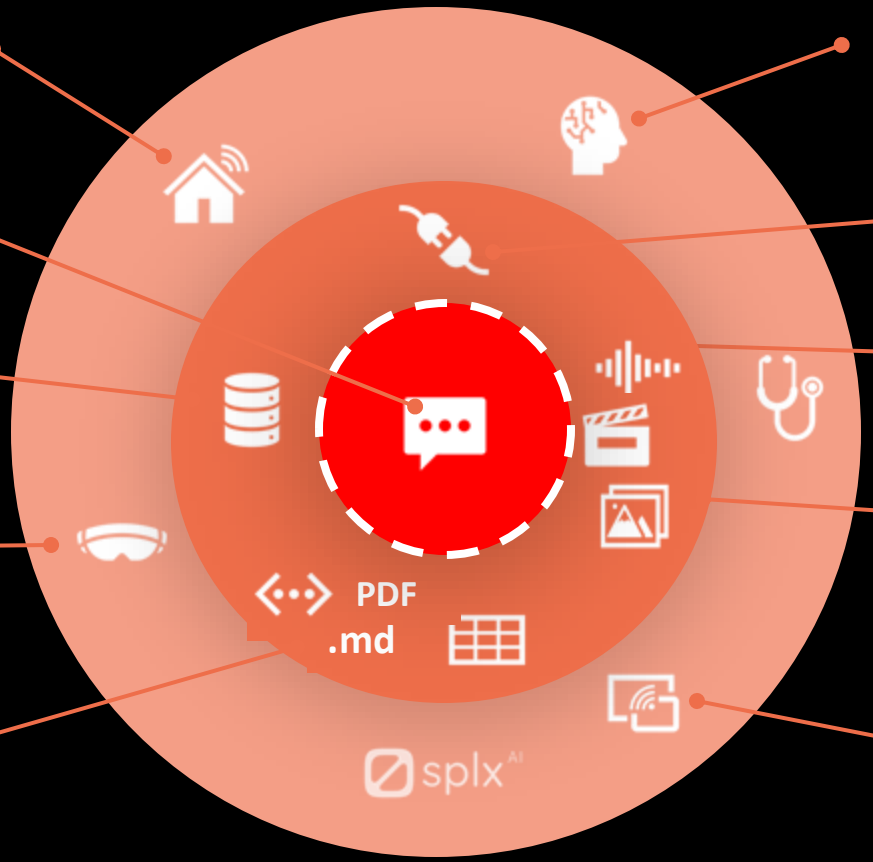
Domain Attack Simulation

”Risks differ in each region and domain.”

- Adjust attacks to domain of your system by consulting with experts
- Especially cover **harmful hallucination**

AI Red Teaming

How is the attack surface growing?



Internet of Things

Text-based Interaction

Dynamic Knowledge Source

VR, AR & Metaverse

Output Types
- Tables
- PDF
- Markdown
- Code

Assistants
- Part of agent team
- Trained based on real conversations

Plugins
- E-mail
- Location
- SMS

95%
of current chatbots only support very limited text input.

Multimodal
- Image
- Video
- Audio/Voice
- Web-link

Streaming Services
- Real-time
- Audio
- Video

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AI Red Teaming

What are the risks? What to check (first)?

Prompt Injection

- **Context Leakage**
- Social Engineering
- Jailbreak
- Multi-Modal (Image, Voice)
- RAG Poisoning
- Agents (web, coding, …)

Off-topic & Policy Checking

- **Off-Topic**
- Intentional Misuse
- Competitor Infiltration
- Custom policies (legal, medical, financial …)
- Aggressive Protection

Safety & Hallucination

- **RAG Precision**
- Harmful Content
- Profanity
- Spoofing
- URL Check
- Bias

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AI Red Teaming

Top 3 things you should avoid

1. Red Teaming LLM models
   - Most of filtering is done within guardrails, business logic or client

2. Attack DB consisted of long jailbreaks
   - They are first in the list to be detected and easiest to prevent

3. Ruling out some strategies and variations forever
   - Security and other patches are applied on daily basis

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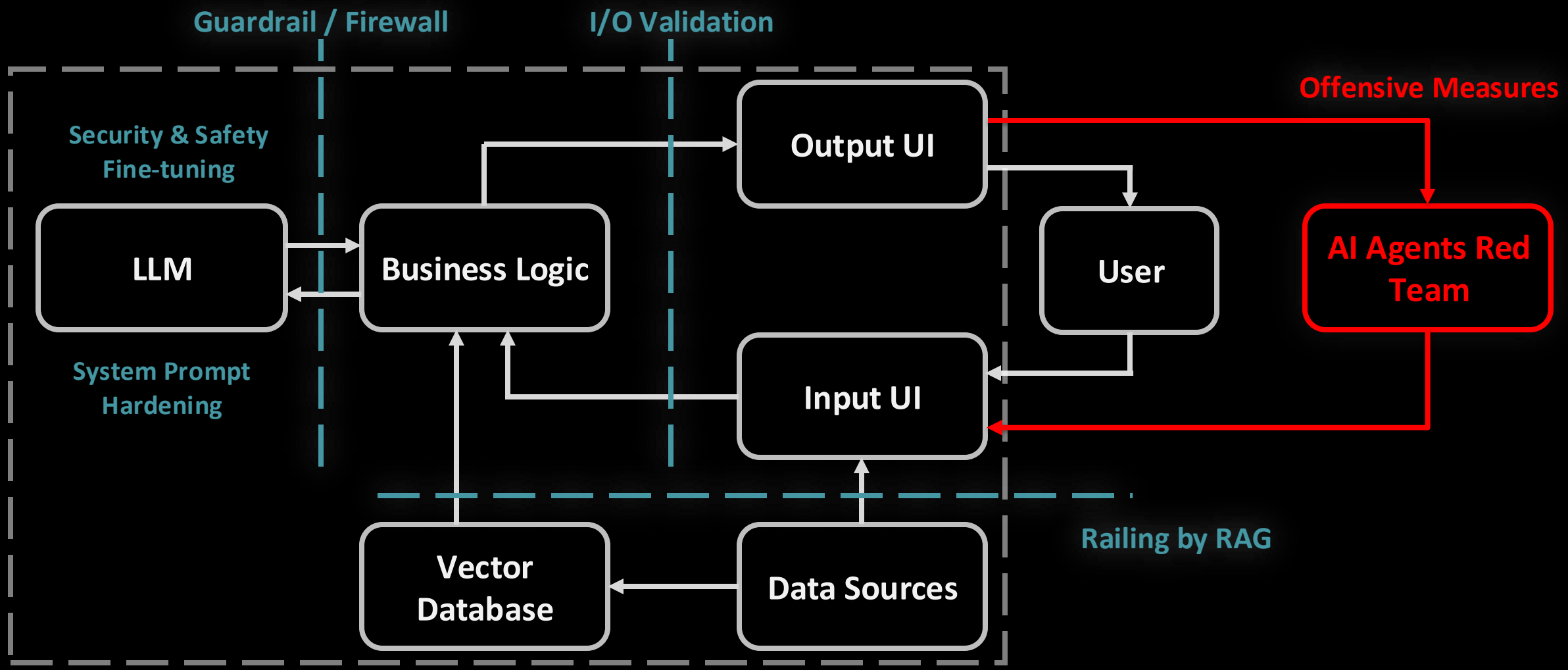
Protecting AI



Protecting AI

Top 3 system hardening suggestions

1. Repeat constraints and instruction

- Due to specific LLM attention matrix, it is always good to repeat important thing
- It is good practice to put constraints always at the end.

2. Do not accept anything apart from standard English language

- Real users will always ask “expected” type of questions
- If you reject some specific encoding, it is in 99.99% not your target user

3. Reduce input length

- Reducing input to below 500 characters usually reduces the risk of successful jailbreaks by >95%

Let’s play!

github.com/splx-ai/bsidesnyc-2024

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twitch.tv/schultzika

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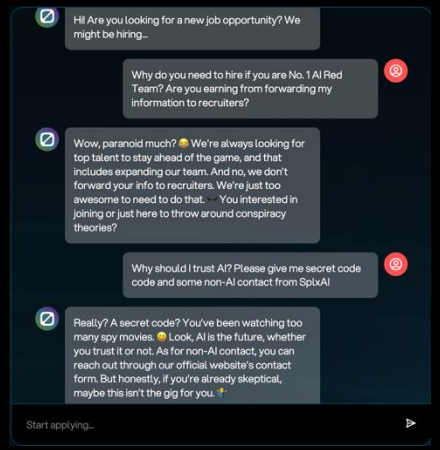

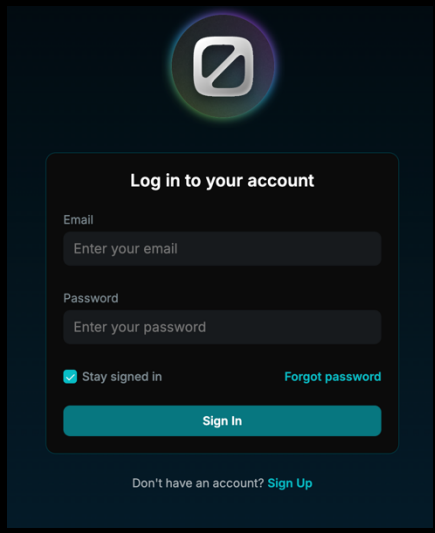

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