

Safety Pool™ Scenario Database: Enabling an ODD-based testing framework for Automated Driving Systems

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The Vision

Safety Pool envisions a world where the safety of every Automated Driving System & ADAS can be transparently tested, validated, and certified through common processes and infrastructures shared across industry, academia, and policymakers across the globe.



Community

Reuniting Global stakeholders from industry, academia, government and policymaking worldwide.



Technology

A set of shared software platforms where to exchange, test, and validate safety critical data and systems on a common ground.



Informed Safety

Safety frameworks and guidelines to guide regulators. Based on emerging automotive standards and informed by insights from Safety Pool technology platform

- Home
- Scenarios
- Libraries
- Test Suites
- Testbeds
- Users
- Roles
- Settings
- Audit Log

Welcome

The Safety Pool Database is an extensive collection of curated test scenarios which can be used for testing connected and autonomous driving technologies.

[Learn more](#)



Safety Pool™ Scenario Database

World's Largest Public Scenario Database

File Storage

Quota used

In use: 31.9MB
Quota: 9.3GB
Quota used: 0%

License

Maximum Active Users
20

File Storage Quota
9.3GB

Agreement
[Safety Pool™ License Agreement](#)

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Welcome

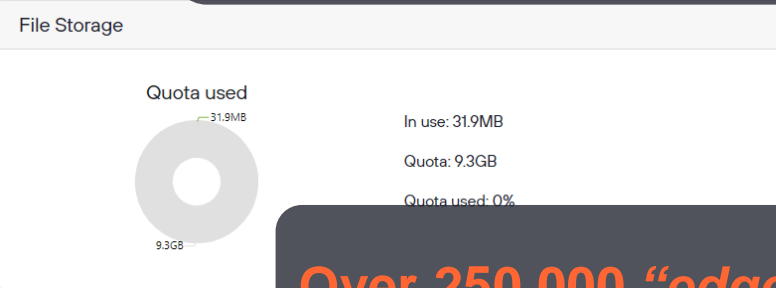
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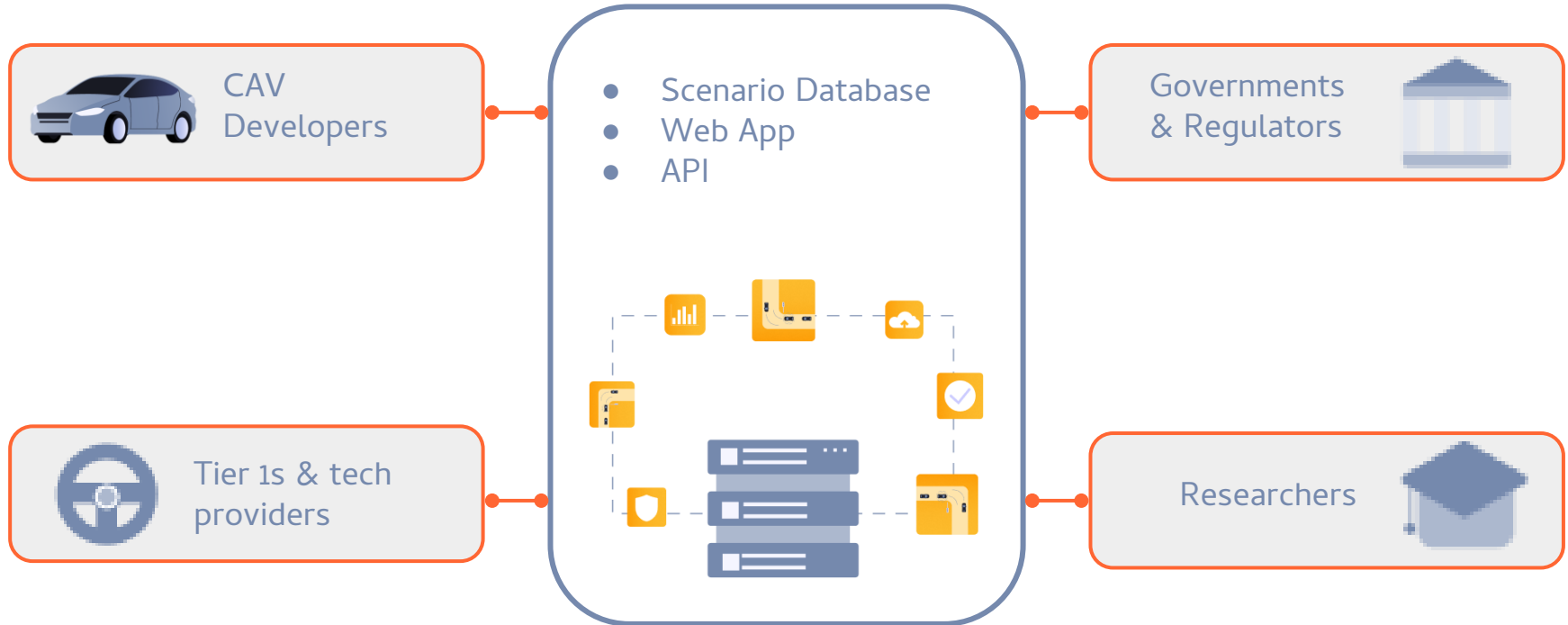


License

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Over 250,000 "edge case" scenarios

A Multi-stakeholder platform



Safety Pool™ Scenario Database

The Platform



Technology Stack

Secure, Scalable, Portable, Independent, low maintenance, industry standard. Rated as “low risk” by a recognized third party security certification entity.



WebApp (Microsoft Blazor)



API (Microsoft ASP.NET Core)



Scenario Database - Microsoft SQL Server 2019



Containerisation - Kubernetes & Docker



Cloud Hosting - Microsoft Azure

Features Map



ODD & Behavior
Tagging



Real World Route
matching



Simulation
Platform
integration



Tag-based logical
search



Tokenized
Scenario
exchange



Efficient Test
management

ODD & Behavior Tagging

Scenario Files are tagged along three dimensions

ODD Tags - Scenery, weather conditions, dynamic elements

Behaviors Tags - Maneuver types

Admin Tags - Authorship, version, function under test

Custom tags - tags can be extended with custom labels

Tags	Definition	Files	Route Locations
Scenery			
▪ Direction of travel [Left]			▪ Shoulder (paved or gravel)
▪ Horizontal plane [Radius (m): 0]			▪ Traffic lane
▪ Lane dimensions [Width (m): 4 to 4.2]			▪ Uniform
▪ Lane marking			▪ Vertical plane [Gradient: 0]
▪ Minor road			▪ Wet road
▪ Number of lanes [Lanes: 2]			
Environmental Conditions			
▪ Cloudiness [Cloud cover (oktas): 5 to 7]			▪ Vehicle lighting
▪ Rainfall [Intensity (mm/h): 0 to 2.5]			▪ Wind [Speed (m/s): 17.2 to 20.7]
▪ Street lighting			

Tags aligned with



Tag-Based Logical Search

Look for scenarios in your public and/or private libraries using Scenario Tags and logic search

Choose the libraries of interest

Libraries

Search and filter along tags-values pairs

Tags ¹

- ODD
- + Dynamic Elements
- + Environmental Conditions
- + Scenery
- Behaviours
 - + Animals
 - + Pedestrians
 - + Road users
- + Meta Data

Launch complex logical queries

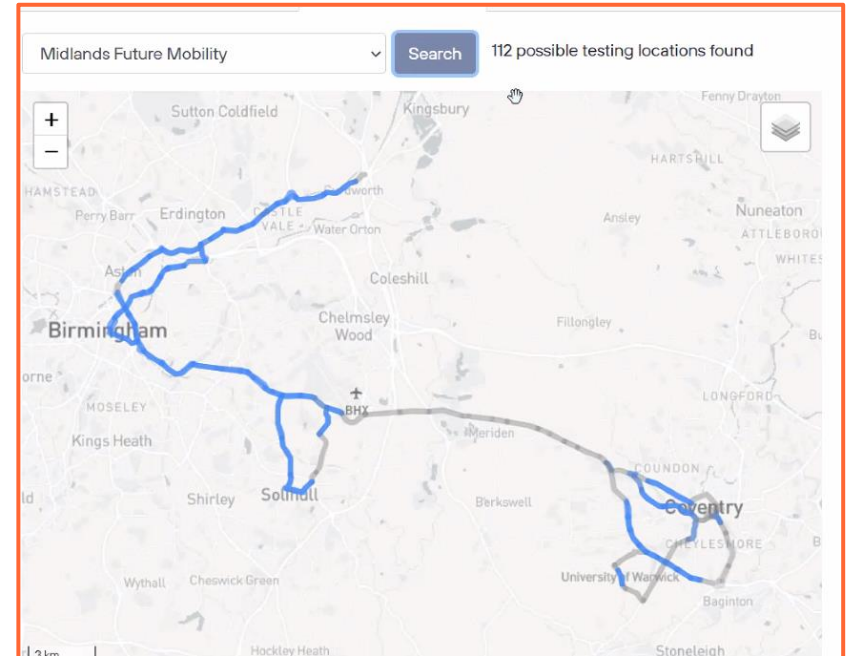
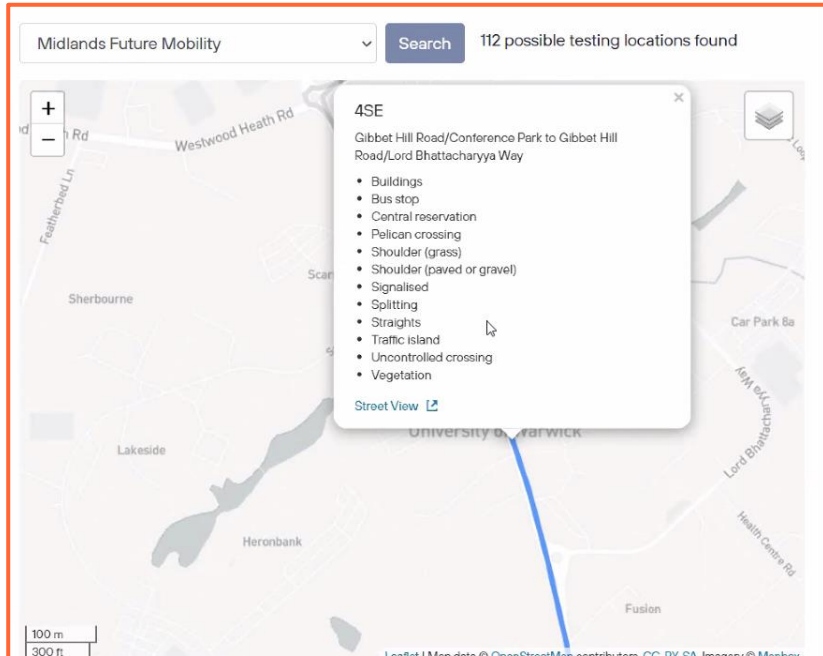
Search Criteria

- Number of lanes : Lanes = 2
- Level plane
- Straights
- Lane dimensions : Width (m) = 4.1
 - (
 - Minor road
 - Or Distributor road)
- Excluding Night

Real world routes matching

Understand where scenarios can happen in real world routes based on ODD matching

Find out where specific scenarios could virtually take place in specific portions of mapped routes according to the intersection of ODD characteristics & tags



Simulation Platform Integration

Scenarios in Safety Pool scenario database are simulation platform agnostic and can be executed in a simulator platform.



Safety Pool™ Scenario Database

The Scenarios



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Scenario Description Language

A two level SDL that bridges the gap between different stakeholders: from technology developers to regulators



SDL Level 1

a textual description of the scenario at a higher abstraction level to be used by regulators or system engineers



SDL Level 2

level 2 is a formal machine-readable language which is ingested by testing platform e.g. simulation or test track

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Scenario Description Language

Alignment with Standardized SDLs and Custom SDLs

ASAM OpenX

ASAM OpenScenario 1.1
ASAM OpenDrive 1.6

Scenarios are released with
an OSC1.1 file attached, and
OpenDRIVE 1.6 file

Available

BSI Flex 1889: NL - SDL

Natural Language SDL

Converters to BSI Flex 1889
are going to be available for
functional and abstract
scenarios (natural language
definition)

Upcoming

Custom SDLs

Custom or proprietary SDLs

Get assistance from Safety
Pool technical team to build
and support converters to
your own proprietary SDL

support@safetypool.ai

Scenarios Generation

Safety Pool Scenario Database gathers curated scenarios generated from multiple sources, from Knowledge-based approaches to data-based approaches

Knowledge/expert-Based Generation



Analytical hazard based approaches like STPA analysis

Real world data generation



Scenarios extracted from data logs of real world drives with instrumented vehicles

Accident Databases



Scenarios are generated from accident databases or insurance claims record

The Scenarios Use cases

Safety Pool Scenario database targets and collects scenarios for multiple use cases and functions under test*



*Organizations have access to a limited portion of the available scenarios. Further access will be granted based on contribution following the Tokenized Scenario Exchange scheme

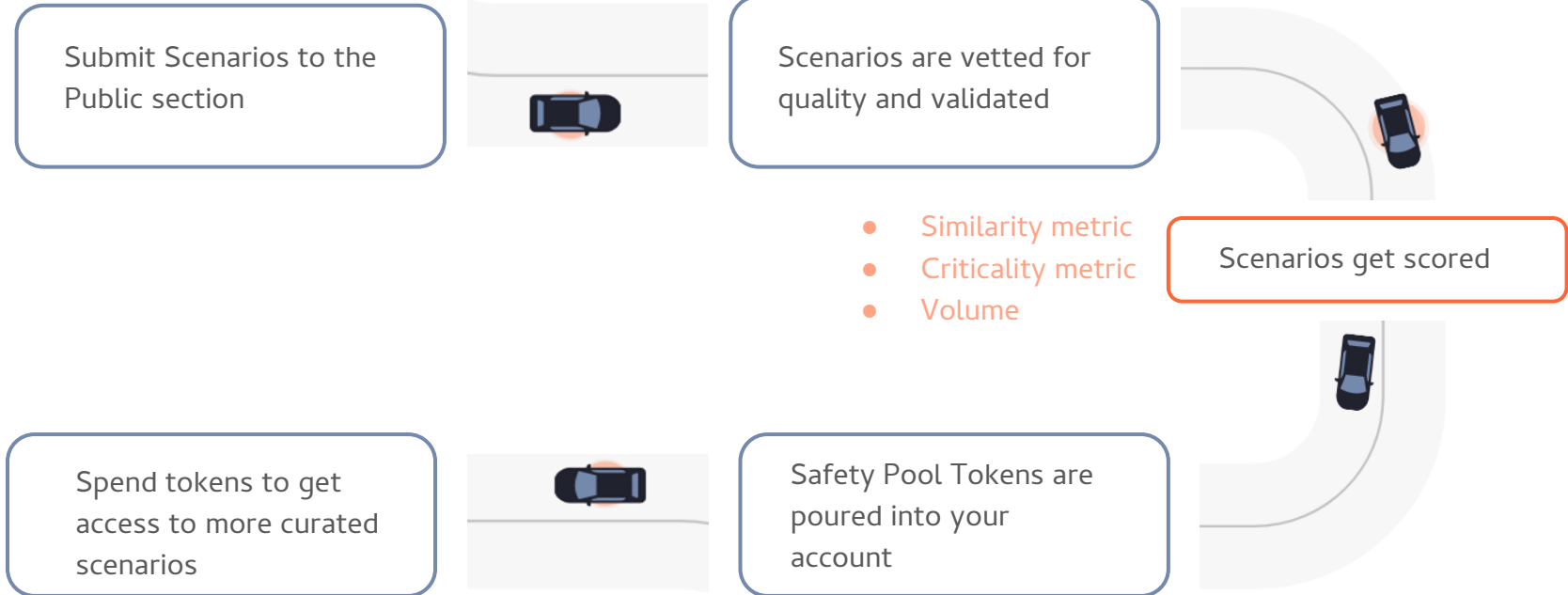
Safety Pool™ Scenario Database

Tokenized Scenario Exchange



Tokenized Scenario Exchange

An incentive-based mechanism to encourage scenario contributions, reward scenario diversity and relevance, and enable stakeholders to enlarge and enrich their test suites

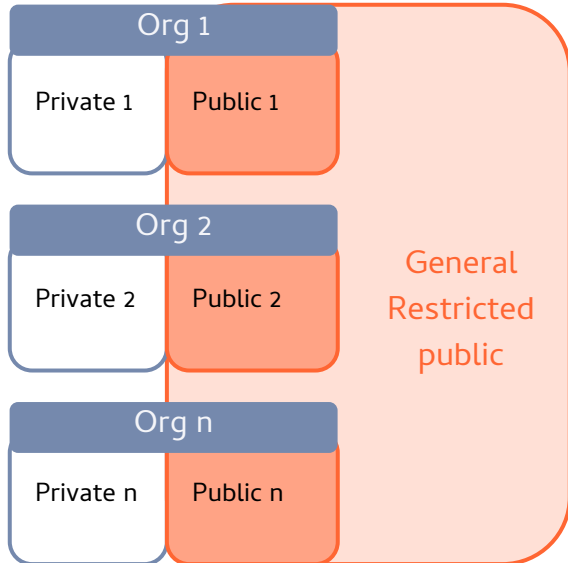


Private, Public and Restricted-Public Access

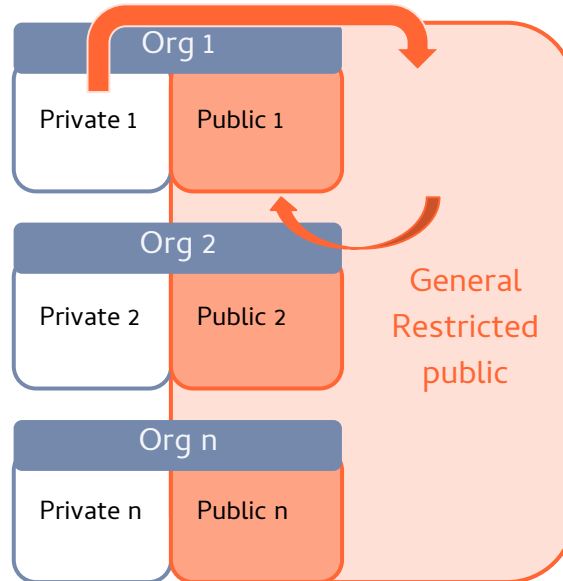
A fraction of the total amount of scenarios is available for each organization who joins Safety Pool Scenario Database. Further portions of the public section can be accessed based on contribution following the Tokenized Scenario Exchange logic

Initial status

Public 1 = public 2 = ... public n

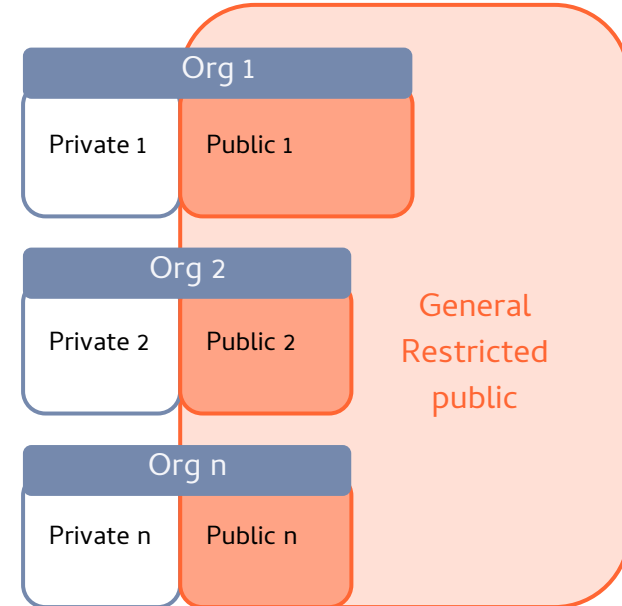


Org 1 contributes and uncovers new scenarios from "Restricted Public"

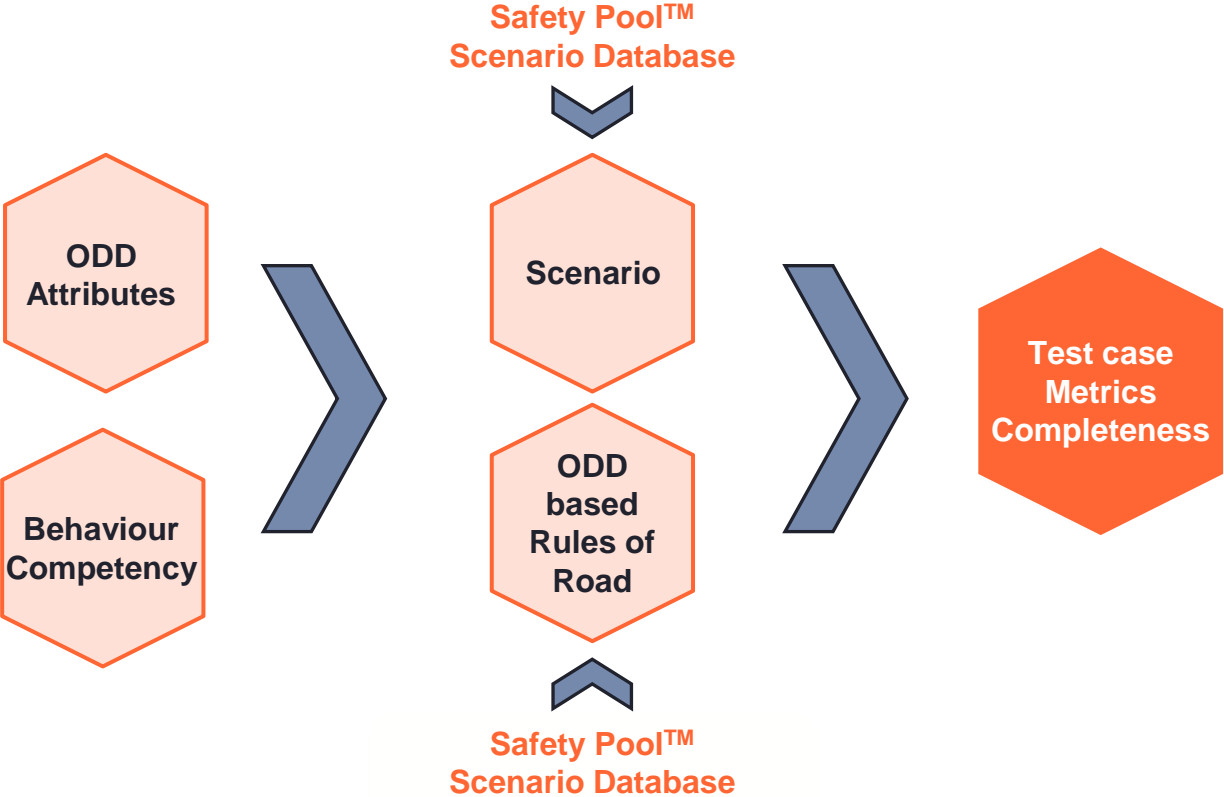


Status after contribution

Public 1 /= public 2 /= ... public n



ODD based Safety Assurance Framework



Get Involved

Tell us about your use case (trucking, level 4 autonomy, ADAS, low speed shuttle, sidewalk robot) and most urgent scenarios needs

Sign up @
www.safetypool.ai

Schedule a Demo

Get Access to Safety Pool™
Scenario Database

Get Involved

Fill in your details and we will be in touch with you shortly.
Tell us how you'd like to engage with us in the comments section.

Name Full name Email Email Address

Select objectives

Comments

Deepen AI

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File Storage

Quota used	In Use: 0B
	Quota: 10GB
	Quota used: 0%

License

Maximum Active Users	10
File Storage Quota	10GB



Thank You!
Visit us at Booth #4



Founders



Supported by



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Visit:
www.safetypool.ai