TUNE INSIGHT

Zero-Trust Healthcare Data Collaboration.

Share insights.
Protect data.

Our Values

TUNE INSIGHT

Share insights.
Protect data.

With Tune Insight, you can collaborate on, valorize, and protect your data and models while maintaining full control over their value.

Minimize cyber risks and ensure regulatory compliance.

Our unique combination of technologies minimizes risks and streamlines compliance to enable a virtuous insights circle

✓ **Regulatory pressure**
- Data privacy
- Data localization

✓ **Cyber risks**
- Minimized transfers
- Security- and Privacy-by-design

✓ **Access to insights**
- Better business decisions
- Eased valorization of own data

Virtuous insights circle

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The Need for Privacy & Security in Healthcare Data Sharing

The Impact

- Healthcare data collaborations are essential for enhancing patient care and advancing medical research and personalized medicine.

- The combination of diverse data sources offers a **complete view of patient health based on Real World Data** and enables personalized treatments.

The Challenge

- Sensitive data must be protected against breaches and attacks, ensuring privacy and security while maintaining efficiency and compliance.

- There is an urgent need for a **robust solution that secures control, governance, confidentiality, integrity, and accessibility.**

Developed from over a decade of research at the **Swiss Federal Institute of Technology (EPFL)**, Tune Insight is spearheading a new era of privacy-preserving precision healthcare driven by collective intelligence.

Our platform supports advancements in personalized medicine and cost optimization by enabling stakeholders — **healthcare providers (hospitals), suppliers (pharma), and payers (insurance)** — to analyze sensitive data from multiple sources without compromising privacy.
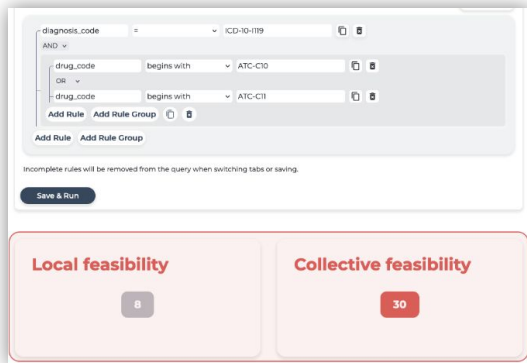
SUPPLIERS

PAYERS

PROVIDERS

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The Streamlined Path to Insights

1. Discovery/Feasibility → 2. Exploratory Analysis → 3. Workflow definition → 4. Authorization → 5. Access To Insights

Data Catalog Explorer
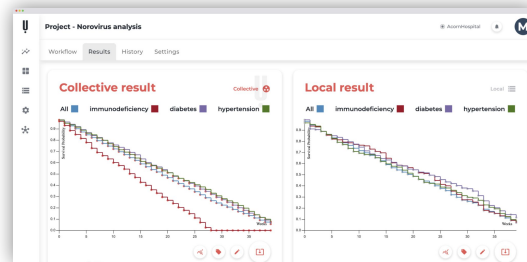Filter data to select subsets and explore patient cohorts for medical analysis.

Sandboxing Environment
Work on synthetic data to refine your workflow.

Analysis UI with Python
Choose and parameterize your data analysis pipeline and customize workflows to gain the insights you need.

Governance & Control UI
Be in full control of your data, from authorizing incoming requests automatically to defining your privacy policy and data process audits.

Results UI
Get instant access to insights, visualize computation history, download results, and connect insights to your dashboard.

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Key Features & Advantages

Tune Insight securely connects datasets for advanced healthcare analysis, facilitating precision medicine and research without data export.

The platform provides insights through a web GUI or API interfaces, enabling stakeholders to effectively improve treatment identification, risk assessment, and patient care while ensuring data security through formal mathematical guarantees.
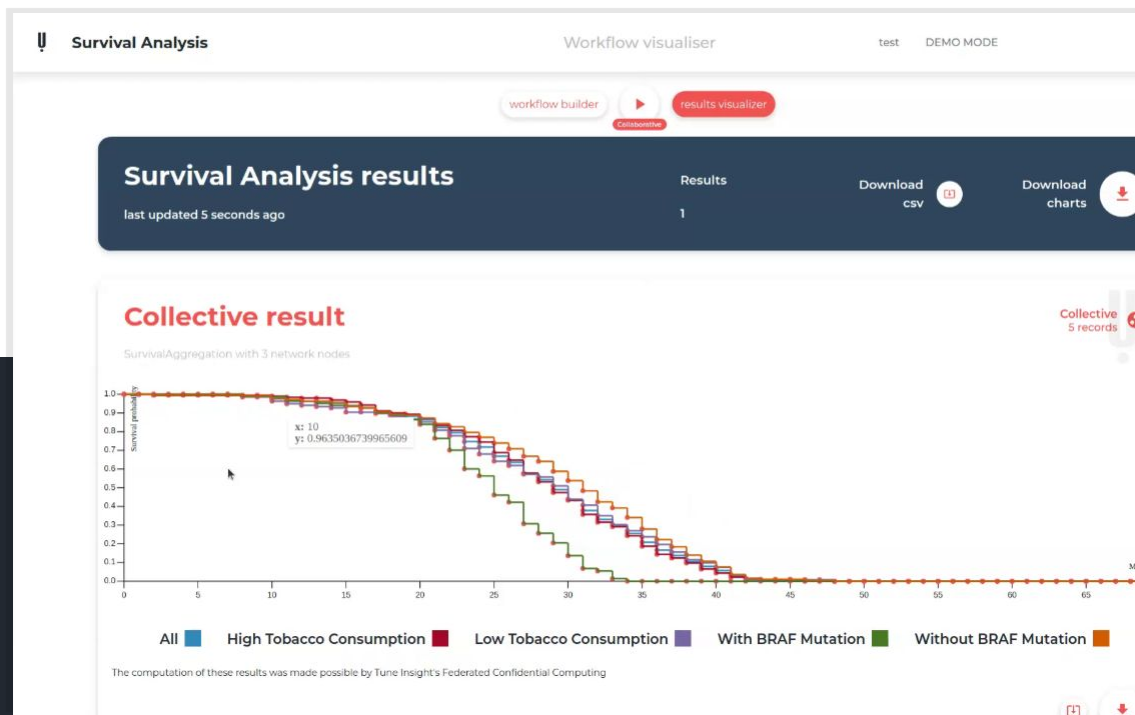
Tune Insight enables:

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Control and Governance
Get the benefits of collaborations without the risks

- Raw data doesn't move and is never revealed to others
- Only approved computations can be executed
- Logging and auditing

Time to value
Enhance the ability to precisely obtain actionable insight from RWD to tailor treatments to individual patient needs

- Cohort exploration, feasibility analysis, hypothesis testing
- Descriptive statistics, survival analysis, GWAS
- ML model training and evaluation

Compliance Ease
Meet stringent data protection and information security policies regulations effortlessly

- Minimized risk, privacy-/security-by-design
- Data protection regulations (GDPR, nFADP, etc.)
- H+, OWASP

Future ML/AI Readiness
Be prepared for next-gen AI advancements by facilitating secure, collaborative model training and data analysis

- More meaningful and precise analytics
- Securely federated datasets
- Quantum-safe protection

Technology combination for secure healthcare data collaborations:

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Secure Multiparty Computation
Enables data owners to fully control when and how results are decrypted for authorized users.

Homomorphic Encryption
Allows collective computations on aggregated encrypted data, ensuring it stays secure throughout the process.

Federated Learning
Facilitates the development of machine learning models without centralizing data.

Synthetic Data
Performs exploratory analyses with more flexibility and privacy guarantees on synthetic data, and obtains the final accurate results on real data.

Differential Privacy
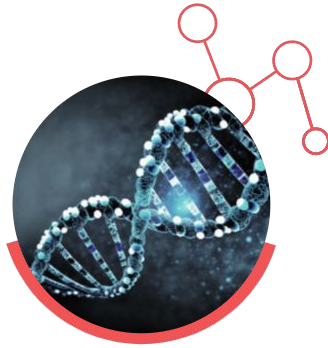Minimizes the risk of re-identification, rendering the results anonymous.

Tune Insight has been instrumental in various sectors of healthcare, such as:

Oncology

Facilitated collective survival analysis, helping to **identify effective cancer treatments.**

Genomics

Supported Genome-Wide Association Studies (GWAS), **accelerating the discovery of genetic markers linked to diseases.**

Pharmacology

Enabled secure collaboration in drug development, leading to the **discovery of biomarkers and the creation of more effective medication.**

Value-Based Healthcare

Assisted in developing precise risk assessment models, **improving patient care strategies.**

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Tune Insight's platform can operate across various infrastructures, such as on-premise or cloud environments, integrating seamlessly with Docker and Kubernetes.

It supports encrypted communications, using configurations like peer-to-peer or a central node that cannot decrypt traffic.


- By utilizing **secure multiparty computation & homomorphic encryption,** the platform allows for collective analysis of multiple datasets without exposing the actual data.

- These processes ensure that generated insights are secure and accessible through a user-friendly interface or API, fostering informed healthcare decision-making.

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Organization
security perimeter

Pharma A

Hospital B

Clinic C
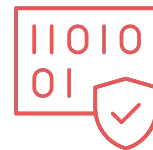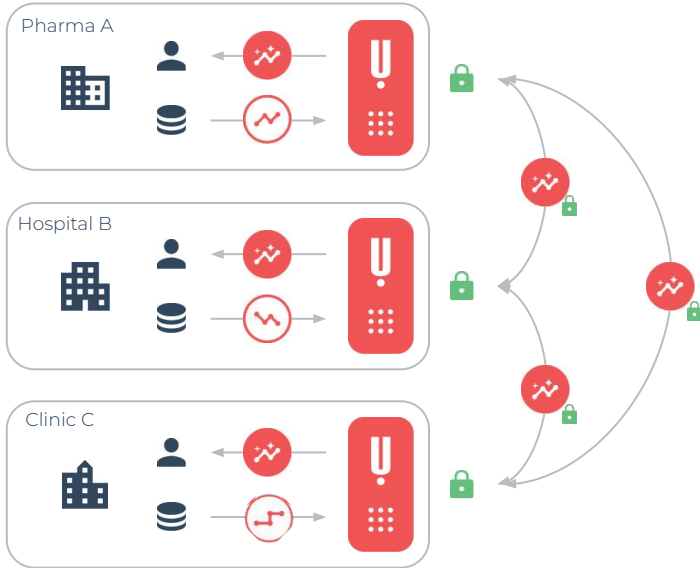
Federated Health Data Space:
Combination of Privacy Enhancing
Techniques

No need for a trusted 3rd party

Tune Insight
Applications

Encrypted
Data

Local Partial
Results

Aggregated
Collective Insights

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Valorize your data with API-level access to insights. Keep control and governance on your data

- Data points
- Curated Set of Operations
- Anonymized results
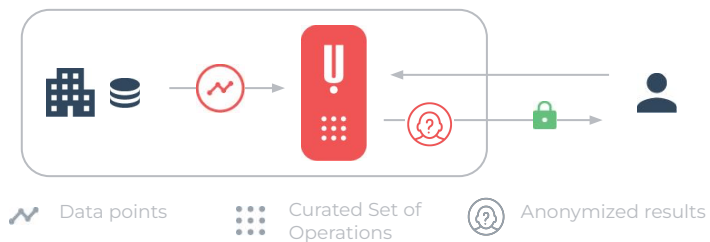
- Curated set of available computations, run within your security perimeter
- Enable exploratory analysis based on synthetic data
- Only release anonymized aggregate results
- Enforced policies
- Fine grained access control
- Workflow authorization and auditing

Tune Insight prioritizes data security and compliance with stringent privacy standards, embedding encryption with mathematical guarantees to protect data across the board.

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GDPR
General Data Protection Regulation

nFADP
New Federal Act on Data Protection

ISO 27001
International Standard for Information Security

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Success Stories

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> "
>
> **Tune Insight's solution is a perfect fit for multi-site and cross-jurisdiction medical analyses where data security and privacy are paramount.**

Prof. Olivier Michielin

Head of the Precision Oncology Department at Geneva University Hospital (HUG), Switzerland

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Tune Insight ranked as the **#1 cybersecurity startup in Switzerland in 2023 and 2024, and top 2 in the Trust Valley Tech4Trust program.**

Tune Insight's software is deployed in hospitals, managed security service providers, and insurances.

Get an in-depth and firsthand look at the power of secure healthcare data collaboration by booking a personalized demo.

Selected Recent Publications

TUNE INSIGHT

D. Froelicher et al. "**Scalable and Privacy-Preserving Federated Principal Component Analysis**." IEEE Symposium on Security and Privacy (2023). https://doi.ieeecomputersociety.org/10.1109/SP46215.2023.00051

H. Cho et al. "**Secure and Federated Genome-Wide Association Studies for Biobank-Scale Datasets**". Biorxiv, 2022. https://www.biorxiv.org/content/10.1101/2022.11.30.518537v1

S. Sav, J.P. Bosuat, J.R. Troncoso-Pastoriza, et al. "**Privacy-preserving federated neural network learning for disease-associated cell classification**." Cell Patterns 2022. https://doi.org/10.1016/j.patter.2022.100487

J.P. Bossuat, C. Mouchet, J.R. Troncoso-Pastoriza, J.P. Hubaux. "**Efficient Bootstrapping for Approximate Homomorphic Encryption with Non-Sparse Keys.**" EUROCRYPT 2022

D. Froelicher, J.R. Troncoso-Pastoriza, et al. "**Truly privacy-preserving federated analytics for precision medicine with multiparty homomorphic encryption**." Nature Communications 12, 5910 (2021). https://doi.org/10.1038/s41467-021-25972-y

J. Scheibner, J.L. Raisaro, J.R. Troncoso-Pastoriza, M. Ienca, J. Fellay, E. Vayena, J.-P. Hubaux. "**Revolutionizing Medical Data Sharing Using Advanced Privacy Enhancing Technologies: Technical, Legal and Ethical Synthesis**." Journal of Medical Internet Research, 2021. https://pubmed.ncbi.nlm.nih.gov/33629963/

C. Mouchet, J. R. Troncoso-Pastoriza, J.P. Bossuat and J.P. Hubaux. "**Multiparty Homomorphic Encryption from Ring-Learning-with-Errors**." PETS 2021. IACR ePrint Archive: Report 2020/304, 2020.

D. Froelicher, J. R. Troncoso-Pastoriza, A. Pyrgelis, S. Sav, J. S. Sousa, J.P. Bossuat, and J.P. Hubaux. "**Scalable Privacy-Preserving Distributed Learning**." PETS 2021. CoRR abs/2005.09532, 2020.

S. Sav, A. Pyrgelis, J.R. Troncoso-Pastoriza, J.-P. Bossuat, J.S. Sousa, J.-P. Hubaux, "**POSEIDON: Privacy-Preserving Federated Neural Network Learning**." CoRR abs 2009.00349, 2020. NDSS 2021

Lattigo library. **https://github.com/tuneinsight/lattigo**

https://tuneinsight.com

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https://twitter.com/tuneinsight

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Thank You!