Sarthak Pati

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Education

Technical University of Munich — Munich, Germany
Ph.D., Computer Science, Summa cum laude — 2025

Technical University of Munich — Munich, Germany
M.S., Biomedical Computing — 2014

Manipal Academic of Higher Education — Manipal, India
B.E., Biomedical Engineering — 2010

Summary

Founder and AI safety researcher with **11+** years building trustworthy, end-to-end AI systems. Founder of **VerySafe.ai**, developing **SafeCompute**, a policy-aware compute platform that attaches cryptographic proof to every AI model run, enabling regulated deployment of frontier and open-source LLMs. Track record of **USD 9M+** in NIH-funded research and high-impact publications in *Nature*, *Nature Communications*, and *IEEE TMI*. Passionate about bridging frontier AI capability with the safety, attestation, and governance infrastructure required to deploy it responsibly.

Technical Skills

Python/Rust/C++	Confidential Computing	Foundational Models / LLMs
PyTorch/TensorFlow	Cryptographic Attestation	LLM Training & Routing
Docker/Kubernetes	GitHub Actions / MLOps	Policy & Governance

Latest Professional Experience

VerySafe AI — Miami, FL
Founder — 01/2026 - Present
- Building **SafeCompute**, a policy-aware compute platform that attaches cryptographic proof (RATS attestation, SLSA provenance, HSM-signed audit chains) to every model run, enabling regulated LLM deployment.
- Built a hybrid LLM router selecting across frontier and open-source models on policy constraints (data residency, sensitivity tier, required certifications), with every decision cryptographically logged for auditor-grade lineage.

Vaiyu Solutions — Miami, FL
Owner and CEO — 10/2023 - Present
- Providing specialized consulting related to AI operationalization for **4+** clients of various sizes.
- Managing an interdisciplinary team of **5** engineers and scientists to deliver end-to-end AI model design, training, deployment, and monitoring solutions across pharma, healthcare, finance, and energy domains.
- Driving AI optimization during pre-training phases to reduce training costs by up to **50%** while improving accuracy.
- Implementing scalable AI solutions through API-driven architectures by leveraging open standards (REST, MCP, A2A), and applying modern MLOps practices to translate cutting-edge AI advancements into impactful business outcomes.

Indiana University — Indianapolis, IN (Remote)
Software Architect — 09/2023 - 09/2025
- Led the creation of "data as IP" and "model as IP" strategies to push R&D efforts into privacy and security applications, culminating in a **USD 3.5 million** grant from NIH/NCI for its research.
- Led the design and development of **8+** projects across inter-disciplinary domains such as healthcare AI, privacy, security, federated learning, optimization, and benchmarking.
- Integrated standardized model training (GaNDLF) to reduce prototyping time by **30%** and optimization routines for model inference to reduce resource requirements between **10-50%** and reduced overall inference latency up to **70%**.
- Created and pushed an organization-level strategy to adopt latest research faster by including native support of latest open-source libraries (such as transformers, lightning, mlflow) in HPC compute stack, reducing the amount of custom research environments and containers needed by up to **20%**.

University of Pennsylvania — Philadelphia, PA
Application Architect — 02/2023 - 08/2023
- Led the R&D of a **USD 1.2 million** grant from NIH to deploy federated learning in real-world healthcare infrastructure.
- Streamlined **10+** legacy projects to improve maintainability and reducing the technical debt over time.

University of Pennsylvania — Philadelphia, PA
Senior Application Developer — 12/2014 - 01/2023
- Led the R&D of a **USD 5 million** grant from NIH/NCI to opertionalize AI for effective use by clinicians.
- Led the software development efforts for a team of **5** developers and **25** researchers

Honors and Awards

- Dean's list for doctoral dissertation (top **10%**) 2020-2024.
- Nature Communications Engineering **Editor's choice** 2023 for "Generally Nuanced Deep Learning Framework" [ref].
- Nature Communications Top **25** Health Sciences Articles 2022 for "Federated Learning in Healthcare" [ref].
- Plenary presentation (top **8**) at Pendergrass Symposium 2023 for "Comprehensive Federated Ecosystem (COFE)".
- Best poster award (top **5%**) at NIH Annual Scientific Meeting of the ITCR funding program 2020 and 2022.
- Oral Presentation (top **5%**) at Pendergrass Symposium 2022 for "AI-based Volumetric Breast Density Estimation with Digital Breast Tomosynthesis".
- Oral Presentation (top **5%**) at Pendergrass Symposium 2021 for "Federated Tumor Segmentation".
- Magna cum laude (top **10%**) at Pendergrass Symposium 2021 for "Generally Nuanced Deep Learning Framework".
- **2nd place** in the Automatic Non-Rigid Histological Image Registration Challenge 2019 [ref].
- **1st place** in the Brain Tumor Segmentation Challenge at MICCAI 2015.

Media Mentions of Research

- Wall Street Journal
- Eureka Alert
- News Medical
- IU News
- Science Daily

Invited Talks (Full List)

- Tutorials (half and full day) on Federated Learning at multiple top-tier AI and clinical conferences:
  - Medical Image Computing and Computer Assisted Intervention (MICCAI)
  - Association for the Advancement of Artificial Intelligence (AAAI)
  - Radiological Society of North America (RSNA)
  - Society for Optics and Photonics (SPIE) Medical Imaging
- Presentation at MRI Together Conference.
- Presentation at University of Edinburgh.
- Multiple presentations at Georgetown University.
- Presentation and demonstration of applications of radiomics and federated learning applications healthcare at the Radiological Society of North America (RSNA) Annual Meet (2016-2021).
- Half Day Tutorial on Cancer Imaging at the IEEE International Symposium on Biomedical Imaging (ISBI) (2018).
- Presentation and demonstration of radiomics integration in healthcare (CaPTk) at the International Society for Optics and Photonics (SPIE) Medical Imaging Conferences (2017-2019).

Service

- Serving as Vice Chair for Algorithmic Development at the Medical Working Group of MLCommons since 2023, a non-profit aiming to improve machine learning for the community.
- Academic reviewer for **10+** journals (IEEE TMI, Nature Communications) and conferences (NeurIPS, MICCAI, SPIE).
- Teaching concepts related scientific programming, production-level machine learning in academic conferences.
- Maintainer of **10+** open-source projects and **40+** conda recipes.
- Active open-source contributor to **50+** projects.

Selected Publications (Full List)

45. A. Linardos, **S. Pati**, U. Baid, B. Edwards, P. Foley, K. Ta, V. Chung, M. Sheller, M. I. Khan, M. Jafaritadi, et al. The MICCAI Federated Tumor Segmentation (FeTS) Challenge 2024: Efficient and Robust Aggregation Methods. (***Machine Learning for Biomedical Imaging***) 2025.
44. D. LaBella, H. Kassem, B. Edwards, M. Sheller, **S. Pati**, A. Aristizabal, R. Huang, U. Baid, A. Karargyris, S. Bakas, et al. IMG-69. FeTS 2.0: Federated learning sets benchmark in post-op GBM segmentation. (***Neuro-Oncology***) 2025.
43. S. Thakur, S. Malec, C. Pitarc, A. Linardos, S. Innani, S. Adap, S. Faghani, M. Moassefi, M. Nasrallah, J. Ahrendsen, et al. IMG-121. BraTS-Pathology 2024: Insights and Future Directions Informed by the AI-RANO & RANO-RGP Effort to Assess Glioblastoma Heterogeneity. (***Neuro-Oncology***) 2025.
42. **S. Pati**. From screening to subtyping in a single glance. (***Patterns***) 2025.

41. S. Thakur, **S. Pati**, J. Wu, R. Panchumarthy, D. Karkada, A. Kozlov, V. Shamporov, A. Suslov, D. Lyakhov, M. Proshin, et al. Optimization of deep learning models for inference in low resource environments. (***Computers in Biology and Medicine***) 2025.
40. M. Zenk, U. Baid, **S. Pati**, et al. Towards fair decentralized benchmarking of healthcare AI algorithms with the Federated Tumor Segmentation (FeTS) challenge. (***Nature Communications***) 2025.
39. **S. Pati**, S. Wagner, et al. An Unsupervised Brain Extraction Quality Control Approach for Efficient Neuro-Oncology Studies. (***Journal of Imaging Informatics in Medicine***) 2025.
38. S. Thakur, **S. Pati**, et al. Optimization of Deep Learning Models for inference in low resource environments. (***IEEE Computers in Biology and Medicine***) 2025.
37. **S. Pati**, R. Turrisi, et al. Adapting to evolving MRI data: A transfer learning approach for Alzheimer's disease prediction. (***NeuroImage***) 2025.
36. **S. Pati**, U. Baid, et al. Pan-Cancer Tumor Infiltrating Lymphocyte Detection based on Federated Learning. (***IEEE Conference on Big Data***) 2024.
35. **S. Pati**, et al. Privacy preservation for federated learning in health care. (***Cell Patterns***) 2024.
34. **S. Pati**, A. Karargyris, et al. Federated benchmarking of medical artificial intelligence with MedPerf. (***Nature Machine Intelligence***) 2023.
33. **S. Pati**, et al. GaNDLF: The Generally Nuanced Deep Learning Framework for Scalable End-to-End Clinical Workflows. (***Nature Communications Engineering***) 2023.
32. **S. Pati**, U. Baid, B. Edwards, et al. Federated Learning Enables Big Data for Rare Cancer Boundary Detection. (***Nature Communications***) 2022.
31. **S. Pati**, P. Foley, et al. OpenFL: The Open Federated Learning library. (***Physics in Medicine & Biology***) 2022.
30. **S. Pati**, et al. The Federated Tumor Segmentation (FeTS) tool: an open-source solution to further solid tumor research. (***Physics in Medicine & Biology***) 2022.
29. **S. Pati**, S. Bakas, et al. The University of Pennsylvania glioblastoma (UPenn-GBM) cohort: advanced MRI, clinical, genomics, & radiomics. (***Nature Scientific Data***) 2022.
28. R. Chitalia, **S. Pati**, et al. Expert tumor annotations and radiomics for locally advanced breast cancer in DCE-MRI for ACRIN 6657/I-SPY1. (***Nature Scientific Data***) 2022.
27. V. Ahluwalia, W Mankowski, **S. Pati**, et al. Deep-learning-enabled volumetric breast density estimation with digital breast tomosynthesis. (***Cancer Research***) 2022.
26. **S. Pati**, V. Ahluwalia, et al. Artificial-intelligence-driven volumetric breast density estimation with digital breast tomosynthesis in a racially diverse screening cohort. (***J. of Clinical Oncology***) 2022.
25. **S. Pati**, S. Thakur, et al. Optimization of Deep Learning Based Brain Extraction in MRI for Low Resource Environments. (***MICCAI BrainLesion workshop***) 2022.
24. U. Baid, **S. Pati**, et al. The Federated Tumor Segmentation (FeTS) Initiative: The First Real-World Large-Scale Data-Private Collaboration Focusing On Neuro-Oncology. (***Neuro-Oncology***) 2021.
23. O. Güley, **S. Pati**, S. Bakas. Classification of Infection and Ischemia in Diabetic Foot Ulcers Using VGG Architectures. (***Springer, Cham***) 2021.
22. **S. Pati**, U. Baid, et al. The rsna-asnr-miccai brats 2021 benchmark on brain tumor segmentation and radiogenomic classification. (***arXiv preprint***) 2021.
21. **S. Pati**, et al. The Federated Tumor Segmentation (FeTS) Challenge. (***arXiv preprint***) 2021.
20. **S. Pati**, L. Venet, et al. Accurate and Robust Alignment of Differently Stained Histologic Images Based on Greedy Diffeomorphic Registration. (***Applied Sciences***) 2021.
19. **S. Pati**, D. Bounias, et al. Interactive Machine Learning-Based Multi-Label Segmentation of Solid Tumors and Organs. (***Applied Sciences***) 2021.
18. **S. Pati**, S. Rathore, et al. Multi-institutional noninvasive in vivo characterization of IDH, 1p/19q, and EGFRvIII in glioma using neuro-Cancer Imaging Phenomics Toolkit (neuro-CaPTk). (***Neuro-oncology advances***) 2020.
17. **S. Pati**, et al. Reproducibility analysis of multi-institutional paired expert annotations and radiomic features of the Ivy Glioblastoma Atlas Project (Ivy GAP) dataset. (***Medical Physics***) 2020.
16. **S. Pati**, et al. Glioblastoma Biophysical Growth Estimation Using Deep Learning-Based Regression. (***Neuro-Oncology***) 2020.
15. **S. Pati**, S. P. Thakur, et al. Brain extraction on MRI scans in presence of diffuse glioma: Multi-institutional performance evaluation of deep learning methods and robust modality-agnostic training. (***NeuroImage***) 2020.
14. **S. Pati**, et al. Estimating Glioblastoma Biophysical Growth Parameters Using Deep Learning Regression. (***MICCAI BrainLesion workshop***) 2020.

13. **S. Pati**, M. Sheller, et al. Federated learning in medicine: facilitating multi-institutional collaborations without sharing patient data. (***Scientific Reports***) 2020.
12. **S. Pati**, M. McNitt-Gray, et al. Standardization in quantitative imaging: a multicenter comparison of radiomic features from different software packages on digital reference objects and patient data sets. (***Tomography***) 2020.
11. **S. Pati**, A. Zwanenburg, et al. The image biomarker standardization initiative: standardized quantitative radiomics for high-throughput image-based phenotyping. (***Radiology***) 2020.
10. **S. Pati**, J. Borovec, et al. ANHIR: automatic non-rigid histological image registration challenge. (***IEEE Transactions on Medical Imaging***) 2020.
9. **S. Pati**, A. F. Kazerooni, et al. Cancer imaging phenomics via CaPTk: multi-institutional prediction of progression-free survival and pattern of recurrence in glioblastoma. (***JCO Clinical Cancer Informatics***) 2020.
8. **S. Pati**, et al. The Cancer Imaging Phenomics Toolkit (CaPTk): Technical Overview. (***MICCAI BrainLesion workshop***) 2019.
7. **S. Pati**, S. P. Thakur, et al. Skull-Stripping of Glioblastoma MRI Scans Using 3D Deep Learning. (***MICCAI BrainLesion Workshop***) 2019.
6. **S. Pati**, C. Davatzikos, et al. Cancer imaging phenomics toolkit: quantitative imaging analytics for precision diagnostics and predictive modeling of clinical outcome. (***Journal of Medical Imaging***) 2018.
5. **S. Pati**, S. Rathore, et al. Brain cancer imaging phenomics toolkit (brain-CaPTk): an interactive platform for quantitative analysis of glioblastoma. (***MICCAI BrainLesion Workshop***) 2017.
4. **S. Pati**, K. Zeng, et al. Segmentation of gliomas in pre-operative and post-operative multimodal magnetic resonance imaging volumes based on a hybrid generative-discriminative framework. (***MICCAI BrainLesion Workshop***) 2016.
3. **S. Pati**, S. Bakas, et al. GLISTRboost: combining multimodal MRI segmentation, registration, and biophysical tumor growth modeling with gradient boosting machines for glioma segmentation. (***MICCAI BrainLesion Workshop***) 2015.
2. **S. Pati**, et al. Accurate pose estimation using single marker single camera calibration system. (***SPIE Medical Imaging***) 2013.
1. **S. Pati**, et al. Real–Time Locomotion Classification using Transient EMG. (***International Conference on Information and Emerging Technologies***) 2010.