

**Sinem Sav**  
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<b>EDUCATION</b>	<p><b>École Polytechnique Fédérale de Lausanne (EPFL)</b>, Switzerland 2018 - <i>PhD Candidate</i>, in School of Computer and Communication Sciences Advisor: Prof. Jean-Pierre Hubaux, Prof. Carmela Troncoso</p> <p><b>Bilkent University</b>, Ankara, Turkey 2016 - 2018 <i>Master of Science</i>, in Computer Engineering Advisor: Prof. Erman Ayday CGPA 3.91</p> <p><b>Bilkent University</b>, Ankara, Turkey 2012 - 2016 <i>Bachelor of Science</i>, in Computer Engineering CGPA 3.66</p>
<b>RESEARCH INTEREST</b>	Privacy enhancing technologies, applied cryptography, big data privacy, privacy-preserving machine learning, federated learning, multiparty homomorphic encryption, biomedical/genomic data privacy.
<b>WORK EXPERIENCE</b>	<p><b>HAVELSAN Inc.</b>, Ankara, Turkey September 2016 - March 2018 <i>Industry Project</i> Privacy-Preserving Medical Databases, application of Paillier cryptosystem and homomorphic operations to health informations.</p> <p><b>HAVELSAN Inc.</b>, Ankara, Turkey April 2016 - July 2016 <i>Software Engineer (Candidate)</i> Command Control and Combat Systems</p> <p><b>Simon Fraser University</b>, BC, Canada June 2015 - September 2015 <i>Undergraduate Research Assistant</i>, on RNA-Design problem with simulated-annealing Advisor: Prof. Herbert H. Tsang</p> <p><b>TAI, Turkish Aerospace Industry Inc.</b>, Ankara, Turkey June 2014 - July 2014 <i>Intern</i>, IT department.</p>
<b>TEACHING EXPERIENCE</b>	<p><i>Teaching Assistant</i> Fall 2014 - Present Bilkent University, Computer Science Department, Ankara, Turkey</p> <ul style="list-style-type: none"><li>• Algorithms and Programming I-Java (CS-101).</li><li>• Introduction to Programming for Engineers - Java (CS-114).</li><li>• Software Architecture Design (CS-411).</li><li>• Object Oriented Programming (CS-319).</li></ul> <p>EPFL, School of Computer and Communication Sciences</p> <ul style="list-style-type: none"><li>• Information Security and Privacy (COM-402).</li><li>• Mobile Networks (COM-405).</li></ul>

- Advanced Topics on Privacy Enhancing Technologies (CS-523)

## JOURNAL PUBLICATIONS

- Sinem Sav, Jean-Philippe Bossuat, Juan R. Troncoso-Pastoriza, Manfred Claassen, and Jean-Pierre Hubaux  
**Privacy-Preserving Federated Neural Network Learning for Disease-Associated Cell Classification.**  
*Patterns*, 3(5), 2022.
- David Froelicher, Juan R. Troncoso-Pastoriza, Apostolos Pyrgelis, Sinem Sav, Joao Sa Sousa, Jean-Philippe Bossuat, and Jean-Pierre Hubaux  
**Scalable Privacy-Preserving Distributed Learning.** *Proceedings on Privacy Enhancing Technologies (PoPETs)*, 2021(2).

## CONFERENCE PUBLICATIONS

- Sinem Sav, Jean-Philippe Bossuat, Juan R. Troncoso-Pastoriza, Manfred Claassen, and Jean-Pierre Hubaux  
**Privacy-Preserving Federated Recurrent Neural Networks.**  
*Under review.*  
Preprint: <https://arxiv.org/abs/2207.13947>
- Sinem Sav, Apostolos Pyrgelis, Juan R. Troncoso-Pastoriza, David Froelicher, Jean-Philippe Bossuat, Joao Sa Sousa, and Jean-Pierre Hubaux  
**POSEIDON: Privacy-Preserving Federated Neural Network Learning.**  
*Network and Distributed Systems Security (NDSS) Symposium, 2021.*  
*Selected as the best paper in CSAW'21 Applied Research Competition in Europe. Selected talk for PPML NeurIPS, 2020.*
- Sinem Sav, David Hampson, and Herbert H. Tsang,  
**SIMARD: A Simulated Annealing Based RNA Design Algorithm with Quality Pre-Selection Strategies.** *IEEE Symposium Series on Computational Intelligence (SSCI)*, 2016.
- Halid Emre Erhan, Sinem Sav, Stas Kalashnikov, and Herbert H. Tsang,  
**Examining the Annealing Schedules for RNA Design Algorithm.** *IEEE Congress on Evolutionary Computation, July 24-29, 2016.*
- David Hampson, Sinem Sav, and Herbert H. Tsang,  
**Investigation of Multi-Objective Optimization Criteria for RNA Design.** *IEEE Symposium Series on Computational Intelligence (SSCI)*, 2016.

## PATENTS

- David Froelicher, Juan Ramón Troncoso-Pastoriza, Apostolos Pyrgelis, Sinem Sav, Joao André Gomes de Sá e Sousa, Jean-Pierre Hubaux, Jean-Philippe Bossuat  
**System and method for privacy-preserving distributed training of machine learning models on distributed datasets**
- Sinem Sav, Juan Ramón Troncoso-Pastoriza, Apostolos Pyrgelis, David Froelicher, Joao André Gomes de Sá e Sousa, Jean-Philippe Bossuat, Jean-Pierre Hubaux  
**System and method for privacy-preserving distributed training of neural network models on distributed datasets**

## INVITED TALKS

- POSEIDON: Privacy-Preserving Federated Neural Network Learning
  - ❖ CAp2021: Conférence francophone en Apprentissage, June 15, 2021 (online).
  - ❖ Contributed talk for PPML NeurIPS'20, December 11, 2020 (online).
  - ❖ RISELab, UC Berkeley, 2021 (online).

- Privacy-Preserving Federated Learning with Multiparty Homomorphic Encryption
  - ❖ Workshop on Privacy Preserving systems, softwares, and tools at the Department of Mathematics and Physics of the Roma Tre University, October 24, 2022, Italy.
  - ❖ Lecture in Advanced Topics in Computer and Network Security, University of Padua, October 27, 2022, Italy.
  - ❖ Contributed talk and invited panelist at the 3rd International Workshop “Towards Auditable AI Systems: From Use Cases to Standardization & Regulation”, November 24, 2022, Germany.

## SERVICE

**Reviewer/Sub-reviewer:** PoPETS, USENIX Security, IET Information Security, BMC Medical Informatics, Computers & Security, ISMB/ECCB 2023.

## STUDENT SUPERVISION

- Natalija Mitic (Ongoing), Master semester project (12 ECTS), Fall 2022.
- Francesco Intoci (Ongoing), Master semester project (12 ECTS), Spring 2022.
- Abdulrahman Diao, Privacy-Preserving Federated Recurrent Neural Networks, Summer@EPFL, 2021.
- Xavier Oliva I Jurgens, Privacy-Preserving Federated Hyperparameter Tuning on Non-IID Data Silos: A Measurement Study, Master semester project (12 ECTS), Fall 2021.
- Shufan Wang, Privacy-Preserving Federated Neural Network Training for Disease Associated Cell Detection, Master semester project (12 ECTS), Spring 2021.
- Simon Nicolas Perriard, Privacy-Preserving Hyperparameter Tuning in Federated Learning Setting, Master semester project (12 ECTS), Spring 2021.
- Raphaël Reis Nunes, Distributed Learning with Neural Networks: a performance analysis under decentralization and server failure constraints, Bachelor semester project (8 ECTS), Spring 2020.
- Claire Marie Louise Lefrancq, Convolutional Neural Networks for Disease-Associated Cell Detection, Bachelor semester project (8 ECTS), Fall 2020.

## HONORS & AWARDS

- 1st prize for the paper “POSEIDON: Privacy-Preserving Federated Neural Network Learning ” in CSAW’21 Applied Research Competition (Prize: 700€).
- 2nd place for the “Homomorphic Encryption-based Secure Viral Strain Classification”, iDASH21.
- Awarded with tuition waiver for Mitacs Globalink Programme, Canada.
- Awarded with tuition waiver from Bilkent University due to high ranking in University Entrance Exam.
- Bilkent University, Senior Design Project, the Best Demonstration Award.

## EXTRA-CURRICULAR ACTIVITIES

Scuba Diving

- PADI Open Water Diver

Horse Riding

- Ankara AtliSpor Club September 2017-2018

Advanced Squash Player

- Bilkent University, Squash Tournament Fall 2017, 1st Place

- Bilkent University, Squash Tournament Spring 2016, 2nd Place

Radyo Bilkent, Ankara, Turkey DJ, September 2013 – September 2014

- Broadcasted 4 hours per week at Radyo Bilkent.