Sociocultural influences for password definition: an AI based study
Opportunity for a 6-month internship

Security Research @ SAP Labs France
Sophia-Antipolis – France

Maintaining security is a constantly shifting task, and we need to respond with continuous learning and research. The portfolio of SAP Security Research contains those topics that we believe are most important for SAP's security future.

SAP's vision to secure business is built on 3 ideals: **Zero-Vulnerability**, to harden the software by eliminating vulnerabilities, **Defensible Application**, to enable the software to identify and prevent attacks, and **Zero-Knowledge**, to make any theft of data useless through encryption.

Considering these aspects, SAP Security Research covers the following focal areas: Anonymization for Big Data, Secure Internet of Things, Software security analysis, Open-source analysis, Deceptive application, Applied cryptography, Quantum technology, and Machine Learning as enabler for the next generation of security.

Security Research proposes a 6-month internship in its Sophia-Antipolis offices (Mougins, France).

INTERNSHIP TOPIC

Every day websites and systems are hacked and penetrated for illegal purposes. Most of the time these hacked websites host their user's database containing login credentials (login and passwords). After a certain period, these stolen credentials become public and accessible for anyone.

Previous works have focused on password modeling without user priors [1] or with specific personal user information for targeted attacks [2]. Nevertheless, a middle ground between the absence of additional user information and highly specific user information exists. If we analyze the content of these leaked credentials, we observe a certain influence of the sociocultural elements in the root keyword composing the password. We propose to study the influence of these sociocultural elements in the password selection of different populations using artificial intelligence algorithms.

The intern's responsibilities will include:
• Data handling and pre-processing
• Environment setup for training (DL framework, GPU)
• Adaptation of existing neural network architectures for current problem
• Result analysis
• Appropriate documentation of all experiments

Relevant References
[1] Melicher, William, et al. "Fast, lean, and accurate: Modeling password guessability using neural networks." *25th {USENIX} Security Symposium ({USENIX} Security 16).* 2016.

[2] Wang, Ding, et al. "Targeted online password guessing: An underestimated threat." *Proceedings of the 2016 ACM SIGSAC conference on computer and communications security.* ACM, 2016.

CANDIDATE PROFILE

· University Level: Last year of MSc or less if the student has a good profile
· Good knowledge of the Python programming language
· Good knowledge of versioning control systems like GIT or SVN
· Good knowledge of data science and machine learning algorithms
· Experience with machine learning and deep learning libraries is a plus
· Interest in research work
· Fluency in English (working language)
· Good oral and written communication skills

SAP **Run Simple**

INTERNSHIP CONTEXT

SAP

Founded in 1972, SAP has grown to become the world's leading provider of business software solutions. SAP is market leader in enterprise application software. The company is also the fastest-growing major database company. Globally, more than 77% of all business transactions worldwide touch an SAP software system. With more than 347.000 customers in more than 180 countries, SAP includes subsidiaries in all major countries. SAP is the world's largest inter-enterprise software company and the world's third-largest independent software supplier, overall. SAP solutions help enterprises of all sizes around the world to improve customer relationships, enhance partner collaboration and create efficiencies across their supply chains and business operations. SAP employs more than 98.600 people.

Security Research at SAP Labs France, Sophia Antipolis

Based at SAP Labs France Mougins, Security Research Sophia-Antipolis addresses the upcoming security needs, focusing on increased automation of the security life cycle and on providing innovative solutions for the security challenges in networked businesses, including cloud, services and mobile.

STANDARD INTERNSHIP PACKAGE

- *Salary*: depending on the length of the internship and your diploma.
- *Lunch*: SAP Labs France has a local cafeteria; interns contribute 2,63 €uro/lunch, like other SAP employees.
- *Holidays*: French Bank Holidays
  - January 1st; April 12th, April 13th, May 1st, May 8th, May 21st, June 1st, July 14th; August 15th, Nov 1st and 11th; December 25th
- *Travel*: no trip will be paid by SAP.
- *Accommodation*: SAP can propose an accommodation for the duration of your internship. The accommodation is subsidized by SAP: the intern pays half of the rental cost: 342€ for a 1-room apartment or 442€ for a 2-room apartment (Choice depending on the availability).

CONTACTS AND PROCEDURE

Please candidate by clicking on this link:
https://jobs.sap.com/job/Mougins-InternshipSociocultural-influences-for-password-definition-an-AI-based-study-MF-Job-06/559679401/?locale=en_US

UPLOAD (all documents must be in English):
- Your CV
- Cover letter
- Any relevant documents