LangSec 2023

The 9th Workshop on Language-theoretic Security and Applications

Call for Papers, Work-in-Progress reports, and Panel Discussions

Software that processes data such as documents, images, videos, and messages is often vulnerable to maliciously crafted input data. **Language-theoretic security (LangSec)** is a design and programming philosophy that focuses on formally correct and verifiable input handling throughout all phases of the software development lifecycle. In doing so, it offers a practical method for *assurance* that software is free from the most common types of security vulnerabilities, namely those related to the incorrect parsing and interpretation of messages between software components (packets, protocol messages, file formats, function parameters, etc.).

LangSec aims to (1) produce verifiable parsers, free of typical classes of ad-hoc parsing bugs, based of unambiguous, formal language definitions; (2) produce verifiable, composable implementations that ensure equivalent (un)parsing of messages and rule out exploitable differences in message interpretation between systems; and (3) mitigate the common risks of ungoverned development by explicitly exposing the processing dependencies on the parsed input.

Important Dates

Research paper submissions due: extended to 28 January 2023, AOE   https://easychair.org/conferences/?conf=langsec2023
Work-in-progress reports and panels submissions due: 5 February 2023, AOE
Notification to authors:: 27 February 2023
Final files due: TBA
Workshop date: May 25, 2023

Call for Papers

The LangSec workshop solicits contributions of research papers and work-in-progress reports related to the growing area of language–theoretic security. LangSec offers a connection between fundamental Computer Science concepts (language theory, computability) and the continued existence of software flaws.

Submissions should be in PDF file format and made via EasyChair. Submissions must not be anonymized. The confidentiality of submissions will be protected as is customary, but submissions with non-disclosure agreements or forms attached will be returned without review. **Shepherding will be available for authors with less academic writing experience.**

Research Papers

The LangSec PC encourages submission of research papers from academia, industry, and government. There is no hard maximum page limit, but length should be justified by the content and quality of the text. The PC expects research papers to vary between 4 and 15 pages in length. Shorter papers are encouraged, but longer papers that document high-quality or extensive experimentation are very much in scope. Submissions should address LangSec principles and anti-patterns, report on practical applications of these principles, discuss the development of curriculum, training material, or frameworks, etc. Research papers are encouraged to address some of the topics listed below, but the list is not exhaustive:

1. inference of formal language specifications of data from samples
2. generation of secure parsers from formal language specifications
3. theory that describes the complexity hierarchy of verifying parser implementations
4. comprehensive taxonomies of LangSec phenomena
5. LangSec case studies of successes and failures

6. measurement studies of LangSec systems or data sets
7. computer languages, file formats, and network protocols built on LangSec principles
8. systems architectures and designs based on LangSec principles
9. re-engineering efforts of existing languages, formats, and protocols to reduce computational power
10. novel system designs for isolation and separation of parsers and processing
11. structured techniques for building weird machines
12. systems and frameworks for post-hoc or design time recognizer definition
13. identification of LangSec anti-patterns; certification of absence
14. models for unexpected computation
15. embedding runtime language recognizers

The PC expects that topics should cover recent LangSec-related advances and or make the connection between research and practical assurance through computability theory. The PC is interested in contributions from type theory, programming languages, and formal methods.

The PC encourages submissions that discuss actual implementations, prototypes, and proofs-of-concept. The resulting talk must not be a product pitch or a product manual, but the PC expects that the demonstration should enlighten and educate the audience to the extent that the audience could subsequently apply the tool or system in their own research or work. Proof-of-concept submissions are encouraged to include in their paper submission links to videos or other media demonstrating the project.

Work-in-Progress Reports

The LangSec PC encourages submissions of work-in-progress reports (between 4 and 10 pages). They should describe ongoing LangSec-relevant projects that are producing promising results but do not yet amount to a full paper. The authors of accepted work-in-progress reports will be invited to give presentations at the workshop. In addition, the PC will invite a select set of high-quality work-in-progress reports to be included in the workshop proceedings.