2018-00608 - [PostDoc2018-KAIROS-IPLSPAI] Model-Based formal security analysis of IoT systems (around software)

Level of qualifications required: PhD or equivalent
Fonction: Post-Doctoral Research Visit

About the research centre or Inria department

The Inria Sophia Antipolis - Méditerranée center counts 37 research teams and 9 support departments. The center's staff (about 600 people including 400 Inria employees) is composed of scientists of different nationalities (250 foreigners of 50 nationalities), engineers, technicians, and administrators. 1/3 of the staff are civil servants, the others are contractual. The majority of the research teams at the center are located in Sophia Antipolis and Nice in the Alpes-Maritimes. Six teams are based in Montpellier and a team is hosted by the computer science department of the University of Bologna in Italy. The Center is a member of the University and Institution Community (ComUE) “Université Côte d’Azur (UCA)getProperty.run as observers to test security on the combined system of programs with their environment.

The work will first focus (together with partners) on a loose definition of the requested features for a prototype tools to support the framework may be considered.
While the primary goal is to provide modeling ideas that lead to publications, the construction of prototype tools to support the framework may be considered.

Assignment

The post-doc will first deepen his/her knowledge on current research on Language-Based and Model-Based security analysis for IoT systems, specially by studying from the works of SPAI partners (here previous background may be a plus, but assessed ability to cope with such type of research in similar domains may suffice).

Then the post-doc will consider the issue of modeling sensing connected objects (and their controllers, or even "digital twins") in a way compliant with reactive and dynamic programming style as advocated in SPAI. The expression of security properties and contexts will be favored by interactions with experts on such topics from the various partner teams.

While the primary goal is to provide modeling ideas that lead to publications, the construction of prototype tools to support the framework may be considered.

Main activities

See above.

The work will first focus (together with partners) on a loose definition of the requested features for a model of sensing connected objects that will be endowed with executable specification dynamics, so that it may be used in simulation or symbolic execution with the actual software-in-the-loop, with properties run as observers to test security on the combined system of programs with their environment.

Skills

The post-doc will consider the issue of modeling sensing connected objects (and their controllers, or even "digital twins") in a way compliant with reactive and dynamic programming style as advocated in SPAI. The expression of security properties and contexts will be favored by interactions with experts on such topics from the various partner teams.

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Technical skills and level required:

Languages: English (French may ease comfort of living in Southern French Riviera)

Relational skills: Good ability for team playing (curious, autonomous while not afraid to ask questions if needed)

Other valued appreciated: Correct writing skills for research reports

Benefits package

- Subsidised catering service
- Partially-reimbursed public transport
- Social security
- Paid leave
- Flexible working hours
- Sports facilities

Remuneration

Gross Salary: 2650 brutto per month