

PhD position at CEA LIST (Atomic Energy Commission, Saclay, France)  
and LSV (CNRS & ENS Cachan, France)

We have one opening for a project called "Synthesis of Maximal  
Invariants for Controlled Switched Systems".

Switched systems are embedded devices widespread in industrial applications such  
as power electronics and automotive control. They consist of  
continuous-time dynamical  
subsystems and a rule that controls the switching between them. Under a suitable  
control rule, the system can improve its steady-state performance and  
meet essential  
properties such as safety and stability in desirable operating zones.  
(see e.g. Laurent Fribourg, Romain Soulat. "Controlled Recurrent  
Subspaces for Sampled  
Switched Linear Systems", Research Report LSV-12-24).

The project focuses on the automatic determination of a maximal  
stability zone of a (differential) system, and its associated  
(discrete) controller.

The techniques involved are:

- set-based numerical methods (interval methods, affine forms, Taylor  
models...) and inner-approximations
- non-linear control
- some validation methods in the large (abstract interpretation,  
model-checking etc.)

This project is located both at CEA LIST, in Saclay, 25km south of  
Paris and in ENS Cachan, 5 km south of Paris.

Interested candidates are invited to contact the principal investigators  
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