

# A Synergistic Multi-Layered Approach for Falsification of Specifications for Hybrid Systems

## Training of the Postdoctoral Researcher

The presence of a postdoctoral researcher is essential in this project because of its very broad scope. This person will ideally have previous training in algorithms, hybrid systems, logic, AI, control and robotics methodologies, and will be able to grasp from the very beginning the broader goals of the project and help the Ph.D. student who will be recruited for this project. The project will offer the opportunity to work across two different and well-established active groups, each of which has a number of Ph.D. students and holds regular group meetings. This person will also gain an understanding of issues related to the dissemination of software as discussed under the Broader Impacts.

Specifics of the training program include the following:

**Orientation** Discuss the postdoc's expectations of the mentor/mentee relationship, the source of funding for the postdoc's compensation, and the scientific and educational goals of the project.

**Building trust** Ask the postdoc about his/her goals and respect and accept them where these are reasonable; if not reasonable, attempt to steer the postdoc to more realistic goals. Encourage feedback from the postdoc regarding his/her need for guidance. Watch for depression, fatigue, isolation, and difficulty concentrating.

**Education/training** Explicitly instruct the postdoc in research methodology and techniques, effective problem-solving strategies, and critical interpretation of the scientific literature. Inform the postdoc of available resources and be willing to refer him/her to someone else for help/information. Discuss a timeline for progress in the research project. Encourage the postdoc to seek additional mentors in the various areas in which s/he will require guidance. Involve the postdoc in establishing successful collaborations. Promote ethical standards for conducting research including compliance with all institutional and federal regulations as they relate to responsible conduct in research. Provide opportunities for the postdoc to participate in the writing and reviewing of papers and grant applications. Provide constructive feedback on oral and written communication skills.

**Evaluation** Conduct periodic reviews with the postdoc. Maintain open communication with the postdoc regarding career goals and options. Offer candid assessment of the postdoc's potential to become an independent investigator.

**Career preparation** Help the postdoc engage in networking; introduce him/her to colleagues at meetings or by phone/email. Play an active role in the postdoc's job search (provide advice on application letters, CVs, interviews, presentations, negotiations, etc.). Offer opportunities for the postdoc to develop supervisory skills through training students and other research staff. Encourage the postdoc to actively seek opportunities for professional experience and advancement (e.g., volunteer on committees, help organize scientific meetings/retreats).

In addition to the mentoring provided within the proposed project, Rice University offers exceptional opportunities for the training of the postdoctoral researcher. These include:

- Participation in NSF ADVANCE activities which include lunches on issues that concern postdoctoral students and an annual very successful workshop "Negotiating the Ideal Faculty Position."
- Rice's Grant writing workshops for NSF and NIH.
- Rice's training in using large clusters and facilities available at National Labs.
- Participation in postdoc lunches organized by the Dean of Graduate and Postdoctoral Studies at Rice that cover topics relevant to this community.
- Participation in the job market workshop, conflict resolution workshop and the entrepreneurship club, all organized by the Dean of Graduate and Postdoctoral Studies.
- Last but not least, due to agreements with the nearby Baylor College of Medicine (BCM), the postdoc will have access to the postdoctoral career development activities at BCM which again cover job search, presentation and interviewing skills, grant writing and issue that relate to successful collaborations.