**SAT/SMT Summer School 2011**  
  
  
SAT/SMT solvers have seen dramatic progress in the last decade, and are being  
used in a diverse set of applications such as program analysis, testing, formal  
methods, program synthesis, computer security, AI and biology. Given the rather  
dramatic explosion in the usage scenarios of SAT/SMT solvers, there is a great  
demand for newer kinds of features and higher levels of performance required of  
these solvers. In order to respond effectively to these demands it is  
imperative that SAT/SMT developers "connect" and engage a diverse set of power  
users directly, and understand their requirements. Similarly, power users need  
a way to talk to SAT/SMT developers to better understand the solver offerings  
and their features.  
  
A summer school provides an ideal setting for such communication. It allows for  
review of basics (theory and practice), presentation of latest solvers and  
their features, and demonstrations and talks on tools/research based on solvers.  
A summer school format allows for longer lectures than conferences, and  
encourages attendance by new users (students, faculty and industrial  
researchers) who want to get an in-depth understanding of the cutting-edge  
research in this area, and/or understand the basics and see whether and how  
solvers can solve their unique problems.  
  
**Goals of the Summer School**

To this end, the goals of this summer school are the following:  
  
1) Connect new and current power users (graduate students, faculty and  
industrial researchers) in an informal summer school setting with SAT/SMT  
developers  
  
2) Enable new users who are 'sitting on the fence' to better understand SAT/SMT  
solvers, and to see whether and how solvers can be used for their problems  
  
3) Foster new research  
  
**Scope of the Summer School**  
  
We plan to have talks on SAT/SMT solvers and tools based on them. The talks will each be 1 hour and 15 minutes long. The talks are categorized as:

* Foundational Aspects of SAT/SMT problem and solvers. Topics include,
  + Modern SAT implementation
  + Modern SMT implementation
  + Theory of DPLL(T)
  + Non-DPLL approaches to SAT
  + SMTLIB Initiative
  + Complexity theoretic aspects of the Boolean SAT problem
* Specific SMT solvers and their applications. The solvers we are thinking of  
  are Z3, MathSAT, Alloy, CVC3, HAMPI, MiniSAT, CryptoMiniSAT, STP etc. The idea is to present the current set of top quality SAT/SMT solvers with a clear focus on an application, and how the solver features enabled an application or a class of applications.
* Talks by power users of SAT/SMT solvers: Topics include concolic testing,  
  program analysis, types in programming language, formal methods, computer  
  security, SAT/SMT for concurrent program testing/analysis, AI and biology.

**Invitees to the Summer School**  
  
We have invited 31 lecturers to give a total of 30 talks over a period of 6  
days (Some talks are shared between 2 lecturers). 25 of these lecturers have  
already accepted our invitation. The attached pdf file gives the list of  
lecturers (the starred ones have yet to respond), the topic and category of  
their talk.  
  
This list represents the leading researchers in SAT/SMT solvers, and the leading  
researchers from the user community.  
  
**IBM Research and SAT/SMT Solvers**  
There are many researchers at IBM who develop and use SAT/SMT solvers towards improving software/hardware reliability and computer security. Some prominent names that come to mind include:  
  
1) Dr. Emina Torlak at IBM TJ Watson Center, New York, the developer of the  
Kodkod/Alloy system used in a wide variety of software reliability tools. Dr.  
Torlak is a lecturer at our summer school.  
  
2) The IBM Haifa constraint satisfaction group  
([https://www.research.ibm.com/haifa/projects/verification/csp/](https://webmail.mit.edu/horde/services/go.php?url=https%3A%2F%2Fwww.research.ibm.com%2Fhaifa%2Fprojects%2Fverification%2Fcsp%2F" \t "_blank))  
  
3) Dr. Ryan Williams at the IBM Almaden Research Center. Dr. Williams has done a lot theoretical work on the Boolean SAT problem. He is also a lecturer at our school.  
  
4) Other groups who may be interested in SAT/SMT technology include groups led by Dr. Frank Tip, Dr. Vijay Saraswat, Dr. Mandana Vaziri, and Dr. Stephen Fink at the IBM TJ Watson Center, New York.

Sincerely,

The Organizing Committee of SAT/SMT Summer School 2011  
  
Vijay Ganesh            (Massachusetts Institute of Technology)  
Daniel LeBerre          (Université d'Artois)  
Cesare Tinelli          (University of Iowa)  
Armin Bierre            (Johannes Kepler University)  
Nikolaj Bjorner        (Microsoft Research)  
Robert Nieuwenhuis      (University of Barcelona)  
Armando Solar-Lezama  (Massachusetts Institute of Technology)  
Martin Rinard          (Massachusetts Institute of Technology)