The URC* 2010 conference took place at King’s College London, 24-26 March 2010, in association with a Spring School on Information and Software Security. URC* 2010 brought together undergraduate students, postgraduate students and leading scientists, with the goal of promoting research in computer science and interdisciplinary topics amongst undergraduate students. By introducing students to new research results and techniques, it encouraged them to start conducting research already during their undergraduate studies. This volume contains selected papers presented by students at URC* 2010 (Undergraduate Research in Computer Science - Theory and Applications). The papers cover a wide range of topics, including algorithm design (in particular, the design of heuristic algorithms for the maximum-leaf spanning tree problem, and the analysis of speed scaling algorithms), programming language design (in particular, language based security, the use of effect systems for automating model extraction, and results on adaptation languages using visual environments) and applications to ray tracing optical phenomena and pattern matching in MIDI files.