

The increasing demand for wireless devices running mobile applications has renewed the interest in the research of compiling techniques for high performance low-power processors. A common example of such architectures are the Digital Signal Processors (DSPs) running in modern cell phones.

Code generation for such architectures is a hard problem. Complex addressing modes, combined with scarce registers and specialized instructions make register allocation, scheduling and instruction selection very difficult. In this talk we will review some of the most relevant problems in compiling for embedded processors. We will focus on register allocation, which is particularly hard in such domain. In order to reduce power-consumption and instruction size, such processors make intensive usage of compact addressing modes. We will cover three main problems on this theme: (a) array reference allocation; (b) offset assignment; and (c) heterogeneous register allocation.

If time allows, we will visit some other interesting embedded code generation problems, like memory bank and page allocation.