Optimizing Cache Access:
A Tool for Source-To-Source Transformations and Real-Life Compiler Tests

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Abstract. Loop transformations are well known to be a very useful tool for performance improvements by optimizing cache access. Nevertheless, the automatic application is a complex and challenging task especially for parallel codes. Since the end of the 1980's it has been promised by most compiler vendors that these features will be implemented - in the next release. We tested current FORTRAN90 compilers (on IBM, Intel and SGI hardware) for their capabilities in this field. This paper shows the results of our analysis. Motivated by this experience we have developed the optimization environment Goofi to assist programmers in applying loop transformations to their code thus gaining better performance for parallel codes even today.