Thinking, Speaking, Writing

a lecture by

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The speaker is a founder of:

- ✓ Research Institute for Symbolic Computation (RISC)
- ✓ Journal of Symbolic Computation
- ✓ Softwarepark Hagenberg

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The first part of this talk will discuss some guiding lines that the speaker developed and pursued when building up his International PhD and Master Programs at RISC. An important aspect of this program is intensive training in the basic skills of research, **Thinking, Speaking, Writing**, as a complement to the special courses offered in these programs. Training in Thinking in the form of **Predicate Logic as a Working Language** plays a particularly important role in this approach to Math and Computer Science education.

In the second part of the talk, the **Theorema Project** will be presented which aims at computer-supporting the process of building up mathematical knowledge bases (inventing concepts, inventing and proving theorems, inventing problems, inventing and verifying solutions to problems, i.e. algorithms). In the frame of the Theorema Project, a major break-through in automated algorithm synthesis has been achieved recently: by the speakers' **Lazy Thinking Method**, non-trivial algorithms like an algorithm for the construction of **Gröbner bases** can be automatically synthesized in a natural way.

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