

- division of a complex problem in several sub problems, reusing parts;
- possibility of embedding a language code (e.g. Perl and Maxima) inheriting a large amount of modules and functions, and providing a strong expressive power for user specific functions;
- a very powerful way of building a large variety of exercises via LaTeX-based templates. (LaTeX has a very rich set of packages that interfaces with a large set of external tools, such as gnuplot, graphviz, and ABC);
- table support and specific table importing notation to deal with tuples lines, providing a separation between processing and data, and constituting a mechanism for contributions of non-expert users (it is easy to add one more line to a table).

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References

- [1] Belmonte, M. V. et al. "Automatic Generation of Problems in Web-based Tutors", *Virtual Environments for Teaching & Learning. World Scientific Publishing, Series on Innovative Intelligence 1*, pp. 237-281, 2002.
- [2] Cruz, P., Oliveira, P. & Seabra, D. "Exercise Templates with Sage". *Tbilisi Mathematical Journal* (in press).
- [3] Dettori, G., & Persico, D. "Fostering Self-Regulated Learning through ICT". *Institute for Education Technology - National Research Council, Italy*, 2011.
- [4] Goguadze, G. "ActiveMath – Generation and Reuse of interactive exercises using domain reasoners and automated tutorial strategies". *PhD Thesis, Universität des Saarlandes*, 2011.
- [5] Gonzato, G. "Making music with ABC plus", http://abcplus.sourceforge.net/#ABC_Guide, 2012.
- [6] Gurtovoi, A., Guerman, A. & Santos, C. "Sistema de Ensino Baseado no Computador: Gerador Automático dos Exercícios". *Proc. of the Engenharia'2005 – Inovação e Desenvolvimento Conference. Covilhã*, 21–23 November, 2005.
- [7] Millán, E. et al. "Using Bayesian Networks to improve knowledge assessment" in *Journal Computers and Education, Vol. 60*, January, pp. 436–447, 2013.
- [8] Pereira, R. M. S., et al. "New e-learning objects for the Mathematics courses from Engineering degrees: Design and Implementation of Question Banks in Maple T.A. using LaTeX". *International Journal of Education and Information Technologies, Vol. 4*, pp. 7-14, 2010.
- [9] Siegel, M. et al. "Promoting Teacher's Flexible Use of the Learning Sciences through case-based Problem Solving on the WWW: A Theoretical Design Approach", in *Fourth International Conference of the Learning Sciences. NJ: Erlbaum, Mahwah*, pp. 273-279, 2000.
- [10] Tomás, A. P. & Leal, J. P. "A CPL-based tool for Computer aided generation and solving of Maths exercises", *Proc. of the Fifth International Symposium on Practical Aspects of Declarative Languages, PADL'2003. Springer-Verlag, Lecture Notes in Computer Science 2562*, pp. 223-240, 2003.