Applying Category Theory to Derive Engineering Software from Encoded Knowledge.
M. Healy and K. Williamson. (Invited Paper). In, T. Rus, ed., Algebraic Methodology and Software Technology, 8th International Conference, AMAST 2000, Iowa City, Iowa, USA, May 2000, Proceedings. Lecture Notes in Computer Science #1816, Springer-Verlag: New York. pp. 484-498.

Abstract. In an industrial research project, we have demonstrated the feasibility of applying category-theoretic methods to the specification, synthesis, and maintenance of industrial strength software systems. The demonstration used a first-of-its-kind tool for this purpose, Kestrel's Specware software development system. We describe our experiences and discuss broadening the application of such category-theoretic methods in industry.

Although the technology is promising, it needs additional development to make it generally usable. This is not surprising given its mathematical foundation. On the other hand, we believe our demonstration is a turning point in the use of mathematically rigorous approaches in industrial software development and maintenance. We have demonstrated here the capture via mathematical methods not only of software engineering design rationale, but also of the product design and manufacturing process rationale used by different engineering disciplines, and the production of usable software directly from the captured rationale. We feel that that further evolution of the tools for this technology will make formal systems engineering a reality.