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Journal or Magazine article

Schank, R.C. (1991). Where's the AI? AI Magazine 12(4), 38-49.

Segre, M.A. (1991). Learning how to plan. *Robotics and Autonomous Systems* 8(1–2), 93–111.

Book

Dym, C.L. (1994). Engineering Design: A Synthesis of Views. New York: Cambridge University Press.

Chapter in an edited book

Nierstrasz, O. (1993). Composing active objects. In *Research Directions in Concurrent Object-Oriented Programming* (Agha, G., Wegner, P., & Yonezawa, A., Eds.), pp. 151–171. Cambridge, MA: MIT Press.

Proceedings

Craw, S., & Sleeman, D. (1990). Automating the refinement of knowledge based systems. *Proc. Ninth Eur. AI Conf.*, pp. 167–172.

Proceedings with publisher identified

Mittal, S., & Frayman, F. (1989). Towards a generic model of configuration tasks. Proc. Eleventh Int. Joint Conf. Artificial Intelligence, pp. 1395–1401. San Francisco, CA: Morgan Kaufmann.

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