Letters

■ Editor:

Varol Akman, in his letter (*AI Magazine*, Spring 1990) criticizing QSIM, quotes both me and Janowski, accurately I believe, describing various limitations of QSIM. At the risk of being scolded again for "employing universal truths and unarguable facts" in support of my position, I must point out that it is the responsibility of a scientist or engineer to document clearly the known limitations of any method he develops and publishes. In addition to truth in packaging, a clear and unblinking examination of the limitations of one's own work is an invaluable guide to further research.

Akman observes, correctly, that QSIM is a purely mathematical formalism for expressing qualitative differential equation models of the world, and not a physical modeling methodology. Our research group has also been concerned with this limitation, so we have developed model-building methods which compile QDEs for QSIM to simulate, either from a component-connection description of a device (Franke and Dvorak 1989, 1990), or from a physical scenario description via qualitative views and processes (Crawford, Farquhar, and Kuipers 1990). These two model-building methods are important elements of the QSIM perspective on qualitative reasoning (Kuipers 1989).

Akman's letter refers to his difficulties obtaining a copy of QSIM. After a careful examination of our records back to 1986, I have no record of a previous request, so I assume it must have been lost in the mail. Since then, I am pleased to report that we have successfully sent a QSIM tape, documentation, and an email update to him. We have received acknowledgement of these, and we are now apparently on cordial terms.

As always, I am happy to distribute the code for the QSIM program to researchers interested in qualitative simulation. I believe that distribution of the code is important because it helps other researchers evaluate research ideas more deeply and critically than would be possible from the published paper alone. Thus far, approximately 120 copies have been distributed. The QSIM program is a research tool, not a product, so any commercial rights are retained, and I cannot warrant that it is free of bugs.

I hope to conclude this debate with the immortal words of Leibniz, "Come, sir, let us calculate."

Sincerely,
Benjamin Kuipers
CIS Dept./Taylor Hall
University of Texas at Austin
Austin, Texas 78712

References

Crawford, J.M., Farquhar, A., and Kuipers, B. 1990 QPC: A Compiler from Physical Models into Qualitative Differential Equations In Proceedings of the Eighth National Conference on Artificial Intelligence. Forthcoming.

Franke, D and Dvorak, D. 1989. Component-Connection Models. In Proceedings of the 1989 Model-Based Reasoning Workshop, 19 August 1989, Detroit, MI (Expanded version, University of Texas at Austin, Artificial Intelligence Laboratory TR 90-1 26.)

Kuipers., B 1989. Qualitative Reasoning: Modeling and Simulation with Incomplete Knowledge. *Automatica* 25:571-585.

■ Editor:

Thank you for publishing our reply to Prof. Kuipers in the last issue. In retrospect, I realize that our letter was somewhat harsh in the following respect: Although it is true that I tried hard in the past to obtain a copy of QSIM, I should report that it is now very easy to obtain the program. Prof. Kuipers recently forwarded me a copy along with excellent documentation. It is very kind of him to provide such a well-engineered program for interested researchers.

I hope this acknowledgment will correct the impression I made that QSIM is difficult to obtain.

Sincerely, *Varol Akman*, Bilkent University, Ankara.