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FOR IMMEDIATE RELEASE   Friday, November 12th, 2010

SCIENCE AND TECHNOLOGY PRESS RELEASE

World first claimed for Welsh computing industry

Following the successful demonstration of a system named *Konrad* at a recent scientific conference, High Tower Consultants Limited, a South Wales software development company, is claiming a world first in cognitive simulation - a machine which "talks" to itself as it solves problems. Having been under development since 2008, the system is now being promoted to university researchers across Wales.

Konrad is a low cost computer simulation of the biological mind. The system is the brainchild of High Tower's CEO and Chief Designer, retired cognitive science lecturer Derek J. Smith. It uses industrially proven database technology generously provided and supported by International Software Products, Toronto, to deliver a machine with life-like mental skills, not least the aforementioned ability to think silently to itself.

What makes *Konrad* different from other artificial intelligence products is its close adherence to what is known about the structures and functions of the human brain. To start with, the software is organised in a highly modular fashion, with different modules for early sensory processing, attention, reasoning, motor planning, and so on, all acting together in a continually repeating cycle. Each module then has its own dedicated memory bank, allowing old memories to be consulted as necessary and new ones added. Advanced navigation through the resulting memory network allows the machine to make true-false judgements and take decisions in the absence of external human control. This makes the software ideal for most types of applied psychological or robotic research.

As a research tool *Konrad's* greatest strength is that it lets you check through what it has done after it has done it. Users are able to print out all the memory fragments the system has accessed, noting where they were found, how their location was calculated, and how long each access took. This is important because it allows the progress of any simulation to be scrutinised at leisure after the event and improved accordingly.

Further research advantages derive from the fact that *Konrad* simulations can be built to order, pre-loaded with controlled past experience. There are no practice or fatigue effects unless so required, and individual *Konrads* can also be deliberately "brain damaged", "drugged", "abused", etc., without ethical consequence. These features allow otherwise "impossible experiments" to be conducted in areas such as speech and language therapy,

remedial and special needs education, and forensic psychology, where the true nature of a particular client's difficulties is not always clear. The system's decision-making autonomy also makes it ideal for hostile environment robotics such as the deep space systems of the next quarter century.

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