CRISIS ACTION PLANNING AND SEARCH AND RESCUE – PUTTING ARTIFICIAL INTELLIGENCE PLANNING TECHNOLOGY TO USE

Glimpse the Future – Kevin Dorrian and Austin Tate
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It is quite uncommon for academic researchers outside the United States to be funded by the US defence research agencies, but Professor Austin Tate's team at the University of Edinburgh has been receiving large-scale funding from the US Defense Advanced Research Projects Agency – DARPA - since 1986.

Professor Tate heads the Artificial Intelligence Applications Institute (AIAI) that was created in 1984 by the University's Court as an applied technology transfer group to take AI technologies into productive use internationally. It emerged from the world-leading Department of Artificial Intelligence at Edinburgh which itself was established in the mid 1960's. AIAI has many highly collaborative links with groups in the US – most having a strong emphasis on planning for crisis situations needing multi-national and large-scale military support.

Three years ago, the School of Informatics was established at Edinburgh and both AIAI and the previous department of Artificial Intelligence are within this School. It has been structured with a teaching organisation, a graduate school and a set of research institutes. AIAI acts as an applied research institute within this structure.

Professor Tate revealed, "One of our longer term research interest and technologies is in Command, Planning and Control. Edinburgh already had a good reputation in planning research and we were doing this work prior to AIAI being formed twenty years ago. Over the years, we have created planning systems that have been used for teaching, as the basis for prototyping, and commercial evaluation, and those have been used as the basis for a number of commercial systems and planners in productive use.

The first planning system is O-Plan (Open Planning Architecture) – a competent planner now running as a web service, created on a long lived research programme between the early 1980s and 1999, funded by a range of partners including UK research councils, the European Space Agency, Japanese companies, UK software houses, the US military, UK military and others. This was followed from 2000 onwards by our current technology called I-X (Intelligent Technology). It takes the assets, ideas and concepts of O-Plan and moves it across into a much more flexible tool to support tasks such as design, planning configuration, scheduling and so on."

Professor Tate has had an involvement over the years with a number of research groupings interested in planning for crisis situations and "military operation other than war" of various kinds – air campaign planning, non-combatant evacuation,

army MOUT - Military Operations in Urban Terrain, work on Replenishment At Sea for the Royal Navy and Search and Rescue for the RAF.

This work has been ongoing since the early 80's, with some of the software houses in Britain, some of the larger aerospace companies in America - Boeing and Lockheed Martin have been distinguished partners in these areas - and with military groups in the UK such as the Defence Science and Technology Laboratory (DSTL) including their commercial spinout called QinetiQ.

The assets that came out of the US DARPA-funded Planning Initiative created advanced planning technologies used in Desert Shield and Desert Storm. The system radically improved the logistics flow leading to a statement from the US Department of Commerce that this single application of AI technology paid back 40 years of investment in AI research by the US government.

Austin Tate led a coalition/multi-national team to work on intelligent agent technology funded by DARPA in the USA and several other governments. This led to the formation of CoAX – (the Coalition Agents Experiment) involving over 30 organisations from 4 countries showing their technology in realistic coalition peacekeeping operations

Professor Tate and his team have progressed to new work also funded by DARPA – it's a new start and its jointly with one of the partners in CoAX, - Jeff Bradshaw at the University of West Florida. This work involves a search and rescue scenario that follows on from the events at the end of the previous CoAX. It principally deals with downed airmen on the water and on the land in simple and complex scenarios.

This moves up to levels where you have coordinated response, by the emergency services, where, for example, there has been an accident and there are projects worldwide which are now starting using similar ideas – this idea of planning, bringing everything together, especially the communications between the agents and the systems involved.

"We bring all this together in a project we now call i-rescue.org – which can be everything from very simple low level help, like preparing checklists through to calling local or regional emergency response and right up to a level where there is multi-national response to a global disaster.

Presently, we are working with a team at the Joint Forces Command in the USA concerned with Personnel Recovery and Search and Rescue, to show new capabilities for complex multi-agency personnel recovery missions comments Professor Tate. Future work on an integrated model for emergency response in fire situations calling on large-scale computational grid simulations to advise the fire fighters is also being looked at with collaborators at Edinburgh and across the UK.