Justification of Resources

Staff

The project requires the complementary skills and experience of staff from both Universities to ensure it succeeds: the University of Huddersfield will bring expertise in the knowledge engineering and machine learning aspects of domain models for automated planning and scheduling (APS), whereas the University of Edinburgh will bring their expertise in creating applied planning systems and fielding the technology in real applications, especially in the area of planning for emergency response. The project requires 3 years duration at both Universities to build up research to achieve objectives 1. (domain model language) and 3. (verification and validation) in the workplan, and to make significant progress in the achievement of objective 2. (learning and adaptation). The fourth objective (demonstrator system) and completion of the second objective will require the project to run to a fourth year at Huddersfield.

Staff (Huddersfield)

Prof. McCluskey: The project requires Prof McCluskey to take overall leadership, be PI at Huddersfield, and to play a part in the research itself. His experience and knowledge in APS, knowledge engineering, verification and validation of formal models, machine learning, theory revision and autonomic systems will be necessary throughout the project, and will feed directly into the workpackages. His position as a leader in the APS community will assist in output (publicising, disseminating and exploiting the work) as well as input (enabling recent leading edge international developments to feed into the work plan). His strong links with the Knowledge Engineering for APS community will be exploited to disseminate results. Therefore 20% of his time will be devoted to the project.

Huddersfield Researcher: The researcher will conduct research under the supervision of Prof McCluskey. S/He will have a PhD in the APS area, skills in knowledge engineering, a relevant publications track record, and experience in carrying out and writing up funded research. Hence an appointment at grade 7 is required. The appointed researcher will work 100% of their time on this project for the four years duration of the project at Huddersfield, and will work on workpackages WP1 (Analysis), WP3 (Representation and Ontology), WP5 (Acquisition and Adaptation) and WP6 (Demonstrator System).

Staff (Edinburgh)

Prof. Tate: The project requires Prof Tate to be PI at Edinburgh and responsible for the management there. Prof Tate has been the PI on many projects as shown in the Case for Support and is therefore very capable of leading this project at the Edinburgh site. He will also contribute to the technical side, specifically in work package 3 (Planning Domain Model Representation and Ontology) where his experience will be of great value to the project. Therefore 10% of his time has been allocated to the project.

Dr. Wickler: The project requires Dr Wickler to be responsible for all the work packages that are Edinburgh-led. His work on various research projects at AIAI (including as PI) qualifies him for this work. Dr Wickler will also be responsible for the supervision of the RA. His technical contribution to the project will be mostly in WP2 (Configuration of Simulation Environment) where his work on the OpenVCE project will be relevant and WP4 (Verification and Validation) which will build on his recent research in domain analysis using features. Furthermore, his links to the ISCRAM community will be exploited to disseminate results of the projects. Therefore 25% of his time has been allocated to the project.

Edinburgh Reaearcher: This researcher must be able to conduct research under the supervision of Dr Wickler. S/He must have an excellent MSc or a PhD in a relevant subject, and a proven ability to conduct publishable research. This appointed (grade 7) researcher will work 100% of their time on this project, and will work on WP1 (Analysis), WP2 (Configuration of Simulation Environment), WP4 (Verification and Validation) and WP6 (Demonstrator System).

Travel

To disseminate the results, get feedback on our work and interact with relevant colleagues it will be necessary to travel to various international conferences. Travel to conferences will be split between Huddersfield and Edinburgh, in the sense that joint publications can be presented by one member of the team to save on resource. Hence some of the travel is complementary between Universities, and some will be duplicated (where trips are for meetings, or for conferences where a range of activities will take place such as paper delivery, technical demonstrations, competition involvement, workshop organisation etc.). We estimate that we

will attend and contribute to circa 12 conferences during the project, with 10 single person and 2 conferences with two persons attending (one from each institution).

Project Meetings: In addition to conferences a number of trips to project meetings will be necessary. This will include a kick-off meeting, technical meetings, project reviews, and meetings with application partners. Milestone meetings M0,2,4,6,7,8 will be at Huddersfield, with M1, M3, M5 at Edinburgh. Hence we anticipate four shorter meetings (one overnight stay, 2 people each) visits to Huddersfield for Edinburgh staff and three for Huddersfield. Visits to collaborators we anticipate as six longer meetings (2–3 overnight stays, two people) in the first 3 years, and 2 short meetings for staff from Huddersfield in the fourth year.

Conferences (Huddersfield): Specifically, we intend to present results at ICAPS 2013 and 2015, the most important conference for AI Planning. Additionally we assume we will present at 6 other conferences and workshops in Europe and the USA. The longer term locations of relevant conferences are not known, so a fair distribution in order to estimate travel costs is assumed.

conference/ location	trips (single person)	est. cost per trip
ICAPS (2013,15)	2	£1500
USA (eg AAAI)	2	£1800
Europe and UK	4	£850

The estimated cost per trip includes travel by plane or train, accommodation, subsistence and the conference fee. Total for conference travel over four years is £10000.

Project Meetings (Huddersfield):

duration of stay	trips (single person)	est. cost per trip
1 night	10	£300
2–3 nights	6	£500

Again this includes travel by plane or train, accommodation and subsistence. Total for project meeting travel is £6000.

Conferences (Edinburgh): We intend to present results at ICAPS 2014, the most important conference for AI Planning. Another important conference we will target is ISCRAM 2012 in Canada, which is more application oriented. The longer term locations of relevant conferences are not known, so a fair distribution in order to estimate travel costs is assumed.

conference/ location	trips (single person)	est. cost per trip
ICAPS 2014	1	£1600
ISCRAM+1 USA	2	£1800
Europe	3	£1200

The estimated cost per trip includes travel by plane or train, accommodation, subsistence and the conference fee. Total for conference travel is £8800.

Project Meetings (Edinburgh):

duration of stay	trips (single person)	est. cost per trip
1 night	8	£300
2–3 nights	6	£500

Again this includes travel by plane or train, accommodation and subsistence. Total for project meeting travel is £5400.

Direct Costs - Computing

The project will involve significant amounts of programming and experimentation. The computing equipment must have graphics adaptors capable of rendering the simulation results in real time (e.g. by running the Second Life Viewer). Additionally we will require at each of the two sites a dedicated server capable of virtual world simulation. These computing items of equipment are project specific, and no other similar equipment exists available to the researchers for these purposes.

Computing (Huddersfield) : The Researcher will require a laptop computer (e.g. MacBook Pro or equivalent, £1500 each) with required graphics adaptors, plus dedicated server capable of virtual world simulation (Mac Pro Quad-Core or equivalent, £2000).

Computing (Edinburgh) : Both, Dr Wickler and the new RA will require a laptop computer (e.g. MacBook Pro or equivalent, £1500 each) with required graphics adaptors, plus dedicated server capable of virtual world simulation (Mac Pro Quad-Core or equivalent, £2000).

Other Costs - Publications and Consumables

To hire a new RA in both establishments the recruitment cost will be approximately £500 per University. For publications in high quality, open access journals we expect to incur publication fees, and there will be costs such as books (e.g. Edelkamp's new Heuristic Search book and books on Programming in Second Life), dissemination materials such as posters, printing paper, cartridges, and software licenses, costing in total an estimated £1500 at each establishment over the duration of the project.