**E1 Budget Justification**

**Year 1 (2017)**

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| **Description** | **Cash** | **Justification** |
| **Personnel** |  |  |
| Research Associate – Computer Science (Level B3, 1.0 FTE) | 139,595 | This Computer Science Research Associate will need to have overall technical oversight of this project. It needs to be a relatively senior postdoctoral appointment because of the range of interdisciplinary research expertise in software engineering, human computer interaction and mathematics required. In particular, prior expertise in the Extempore programming language and environment would be valued for this position and would warrant the higher level appointment. |
| Research Associate – Mathematics (Level B1, 1.0 FTE) | 122,573 | This Mathematics Research Associate will need to have specialist expertise in the area of sparse grids and uncertainty quantification. Research experience in the engineering of substantial modelling software will also be expected. Level B1 is appropriate for a beginning post doc. |
| PhD/HDR stipend – Computer Science | 25,861 | The Computer Science PhD project will be primarily concerned with methodological aspects of live-coding in the software engineering process. The project will start by building mock disaster response game scenarios and then conducting experiments with prototype software and humans playing these game scenarios. As the main software suite comes together these scenarios will become more realistic. We will need an applicant who has experience in live programming, a specialised skill. |
| PhD/HDR stipend – Mathematics | 25,861 | The Mathematics PhD project will be primarily concerned with flood-surge modelling. At present our major expertise is in tsumami modelling with uncertain bathymetry data. This project will focus on down-stream surge modelling and will model forcing functions from disaster swell phenomena. |
| **Travel** |  |  |
| Domestic conference - computer science | 2,266 | OzCHI.  Location is unknown at the time of writing. Perhaps Brisbane.  Return airfare Canberra-Brisbane $830.0 (Qantas - Flex). Accommodation Brisbane, Rydges South Bank $169\*4 = $676.  Conference registration $760 (non-member early reg, 2015) No per diem (domestic) |
| Domestic Conference - mathematics | 2,401 | Modsim2017  Paramount modelling and simulation conference in Australia. It provides an excellent venue for the Mathematics Research Associate to present the results of our research.  Registration fee of $850,  Airfare to Tasmania of $840 (Qantas Flex)  Accommodation $711 (Best Western Hobart).  No per diem |
| International conference - computer science | 4,959 | ICSE: (2017) SPLASH  Vancouver.  Registration $850 (US$595)  Airfare Qantas xCanberra $2635.  5 nights accomm. Pinacle Hotel, Vancouver Waterfront $899 (C$177 p. night)  Per Diem: 50% ATO; cost group 5; 50% AT0 = $115,  5 nights $575 |
| International conference - mathematics | 5,485 | SIAM CSE 2017  Costs based on registration $640 (US$450),  Travel (to Atlanta, Georgia, USA) $3280,  Accommodation Atlanta Hilton, $1005 ($201 p. night).  Per Diem: 50% ATO; cost group 5; 50% AT0 = 115, 5 nights $560 |
| **Equipment** |  |  |
| Data server | 2,384 | We will need to have a server to manage the large amount of data that we will collect. A typical machine is the Dell 462-8700 Precision Tower 5810 Workstation features 3.5 GHz Intel Xeon E5-1620 v3 Processor, 16GB of 2133 MHz DDR4 ECC RDIMM RAM, quoted as $2,622 inclusive of GST. |
| Video cameras | 1,350 | We need 3 video cameras to film human experiments, for instance, GOPRO - 8MP - HERO+ LCD – CHDHB-101, quoted as $450 plus incidentals. |
| Video editing software | 1,000 | We will need at least 2 licences for professional video editing software such as Final Cut Pro. Quote $500/licence. |

**Year 2 (2018)**

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| **Description** | **Cash** | **Justification** |
| **Personnel** |  |  |
| Research Associate – Computer Science (Level B3, 1.0 FTE) | 139,595 | Continued funding for Computer Science Research Associate. Build on initial work in first year to start running live programming experiments with initial inundation model framework. |
| Research Associate – Mathmatics (Level B1, 1.0 FTE) | 122,573 | Continued funding for Mathematics Research Associate. Extend analysis of approximation methods for surrogate models via sparse grid and or reduced model methods. |
| PhD/HDR stipend – Computer Science | 25,861 | Continued funding for one of the Computer Science PhDs. |
| PhD/HDR stipend – Mathematics | 25,861 | Continued funding for one of the Mathematics PhDs. |
| **Travel** |  |  |
| Domestic conference - computer science | 2,030 | ASWEC  Location is unknown at the time of writing. Perhaps Sydney  Return airfare Canberra-Sydney (Qantas - Rede-Deal) $240  Accommodation Sydney, Aspire Ultimo $188\*4 = $752  Conference registration $1,038 (non-member early reg, 2015)  No per diem |
| Domestic Conference - mathematics | 2,440 | CTAC2018.  Paramount computational science conference in Australia. It will provide an excellent venue to present the results of our research. Location unknown.  Estimated costs are based on  Registration fee of $850,  Airfare of $840  Accommodation of $750.  No per diem. |
| International conference - computer science | 5,421 | ICSE  Gothenburg, Sweden  Airfare Canberra - Gothenburg $4206  Quality Hotel Panorama $131\*5 = $655  Registration: $932 (IEEE Member rate; 2015)  Per diem 50% ATO; cost group 5; 50% AT0= $115,  5 nights => $560 |
| International conference - mathematics | 5,660 | SIAM UQ 2018  Main international conference for the presentation of research in uncertainty quantification. Location unknown.  Estimated costs based on  Registration $600,  Travel (to US) $3500,  Accommodation $1000.  Per diem 50% ATO; cost group 5; 50% AT0= $115, 5 nights => $560 |

**Year 3 (2019)**

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| **Description** | **Cash** | **Justification** |
| **Personnel** |  |  |
| Research Associate – Computer Science (Level B3, 1.0 FTE) | 139,595 | Continued funding for Computer Science Research Associate. Write up of work in from previous years on live programming experiments with inundation model framework. |
| Research Associate – Mathematics (Level B2, 1.0 FTE) | 131,086 | Continued funding for Mathematics Research Associate. Write up results of previous years on approximation methods for surrogate models via sparse grid and or reduced model methods. Increase to increment B2. |
| PhD/HDR stipend – Computer Science | 25,861 | Continued funding for one of the Computer Science PhDs. |
| PhD/HDR stipend – Mathematics | 25,861 | Continued funding for one of the Mathematics PhDs. |
| **Travel** |  |  |
| Domestic conference - computer science | 2,316 | OzCHI  Location is unknown at the time of writing. Perhaps Adelaide  Return airfare Canberra- Adelaide (Qantas - Flexi) $880  Accommodation Adelaide, Stamford Plaza $169\*4 = $676  Conference registration $760 (non-member early reg, 2015)  No per diem |
| Domestic Conference - mathematics | 2,440 | Modsim2019  Paramount modelling and simulation conference in Australia. It will provide an excellent venue to present the results of our research. Location unknown.  Costs are based on  Registration fee of $850,  Airfare of $840,  Accommodation of $750,  No per diem. |
| International conference - computer science | 4,257 | CHI  Location: unknown  Perhaps Pittsburg, USA?  Return Airfare Canberra - Pittsburg $2582  Hotel - Hyatt Place 6\*135 = US$810 = $1150  Per diem: 50% ATO; cost group 4; 50% AT0= 87.5, 6 nights => $525 |
| International conference - mathematics | 5,660 | SIAM CSE 2019  Main international conference for the presentation of research in computational science and engineering. Location unknown.  Estimated costs based on  Registration $600,  Travel (to US) $3500,  Accommodation $1000.  Per diem 50% ATO; cost group 5; 50% AT0= $115, 5 nights => $560 |