Q&A [AI tools for Flood Assessment & Modelling]

Question No.	Question	Answer
1	It's a great opportunity, do you offer online training courses ?	Yes the Australian Water School offer various live and on-demand courses available here: https://awschool.com.au
1	It's a great opportunity, do you offer online training courses ?	We have a webinar and training series.
2	is 3Di opensource or license based? if license based then what are the basic limit of software use without license?	It is license based, software use is based on the use of storage and usage. Everything, incl type of licenses can be found at www.3diwatermanagement.com
3	How the dam failure been modelled? How the breach parameters been determined (i.e. breach size and time)?	I have to leave this question to Jonas.
3	How the dam failure been modelled? How the breach parameters been determined (i.e. breach size and time)?	the breach uses the verhy and van der knaap formule for breach widht and growth. the flow over the breach is done with a weir formula
4	Can you also integrate rainfall events for dynamic analysis?	Yes, that is possible
4	Can you also integrate rainfall events for dynamic analysis?	You find it under the little cloud icon on the left site of the screen.
5	Can you confirm that when simuliting the flood barrier in 3Di, you can modify the width and height of the barrier?	Within the QGIS plugin, as Jonas is showing that is possible, there you can adjust all schematisations. On the LiveSite you can modify the location, length and height. The LiveSite is mainly used in workshops and stakeholder workshops.
6	How is AI is bieng used in solving the hydrodynamic equations, if it is being used at all, and what equations is the engine solving?	3Di is a hydrodynamic model that includes flow in several domains. It deals with 2D depth averaged flow and with 2D groundwater flow for the saturated zone. Drainage, sewerage and irrigation systems are covered by a 1D computational domain that solves the cross-sectional averaged equations that we have made suited also for pressurized flow and for a range of structures.
7	can you intergret 3Di to global mapper?	I fully expect this to be possible. It would require building tools to assist users to use it.
8	I am DSS-WISE Dam Break regularly in FEMA Region V and Texas. Sudden Complete Failure or partial failure	The example shows a failure with a width of 500 m. we are able to include growth of a breach if needed
9	which inputs we need to provide & which is taken from open source?	the most basic input required is a Digital Elevation Model. They can be taken from open data or can also be derived from Lidar data
10	What is the precision of these results, irrespective of input resolutions.	What is the precision of these results, irrespective of input resolutions.
10	What is the precision of these results, irrespective of input resolutions.	the precision of the results is highly dependend on the precision of the inputs. the computational core of 3Di itself is strictly mass conserving.
11	Can you explain the process of integrating data from various sources to create a comprehensive water management model in the 3Di system? What types of data sources are typically used, and how is the integration achieved?	Typically a DEM is used as the base, for the sewerage, drainage systems it varies per country what is available. for the integration there are several input tools available. In some cases it is simply a push of the button, but mostly it is importing shapefiles and converting them to the sqlite database
12	Can 3Di model sediment transport simulations?	not right now but there is pHd student starting after this summer break to make this possible
13	Does AI take us further or does it use existing data (most "AI" I've seen looks a lot like data mining) (to entrench existing assumptions?	Does AI take us further or does it use existing data (most "AI" I've seen looks a lot like data mining) (to entrench existing assumptions?
14	Is the 3Di system capable of providing real-time monitoring and decision-making support for water management? How does it handle dynamic changes in water flow and adapt to evolving conditions?	yes that is possible. in the Flood Early Warning System that is in place in Parramatta is ran every 30 minutes to have the right amount of water available in the system. the validation of the model on 4 ifferent type of rainfall events shows that it is handling dynamic changes very well.
15	Hello. Does 3Di worked for data-scarce places?	good question, for data scarce places it is applicable on a water shed scale. AI tools can be used to derive buildings to assess the impacts of the flood
15	Hello. Does 3Di worked for data-scarce places?	Can it work in a small- to medium-based watersheds like watersheds in the Philippines?
16	Is there any contribution guidelines to your github if accpecting public involvement?	they should be located in the github repo description. if they can not find them please let me know
16	Is there any contribution guidelines to your github if accpecting public involvement?	Thanks. Jonas.
17	How does the 3Di Water Management system address the integration of weather data and climate change factors into its models? Does it allow for scenario planning and resilience analysis?	yes it does. you can connect to rainfall radar data, or do scenario analysis with uniform rainfall events. Scenario planning is one of the use cases that is used for, there was no time in this webinar to touch on this
18	what are the most suitable algorithms for rainfall flood modeling	This really depends on the goal of your model. Are you looking for accuracy? Or are you looking for speed? If there is enough data available you can use AI to predict rainfall event, but usually there is not enough data for this as rainfall events tend to differ a lot. So a physics based model would be needed for this. An overland flow model can suffice if you're interested in a heavy rainfall event with one peak. In case of multiple peaks infiltration and the sewer system play an important role and a 1D-2D model is required
19	How can I get d/s WL boundary data in coastal region (Bangladesh) for flood forecasting model? Actually I am telling about open source forecast water level near during cyclone or storm surge.	
20	but its accuracy is 800mm in veritical axis. does it give QA part of DEM referance in Final Report after simulation?	
21	We can determine the waterway in the river channels too?	Yes, that is possible
22	How does the AI model compare to traditional methods of flood protection assessment?	
23	What is the training process for the AI model and how often is it updated?	
24	Hi there, Adnan from AIT Thailand originally from Pakistan. May I aslk whether these ppts be shared through emails?	These will be provided with you by the Australian Water School
25	What is the most complex model that you have developed using 3Di? For example, what sized catchment, km of pipes, 2D grid sizing? What is the average computational run time? Have you carried out validation to real events - how did your models perform?	we have recently performed a validation on four different rainfall events in parramatta. the results look quite good, happy to share them with you. feel free to reach out after the presentation and I'll sent it via email
26	How far we are to actually use this for flooding and can we really trust in this data and model ? Can we evaluate urban damage from this or population damage	This dpends on the data quality that you have. In case of the Parramatta example the data is very good, and because there have been several calibrations and validation events we are quite confident of the model performance
27	How accurate is your discussed AI model in predicting the effectiveness of the suitabality of flood barrier?	
28	How much data is enough data to feed the AI beast?	

#	Question	Answer
29	What data sources and variables are used in the AI model to determine the suitability of the flood barrier?	
30	I wonder how quickly this tool can run a model in comparison to TUFLOW running using a powerful computer!?	I wonder how quickly this tool can run a model in comparison to TUFLOW running using a powerful computer!?
31	How your developed AI model handle uncertainties and unknown factors in its suitability assessment?	
32	one of most frequently changing inputs is land use. is there an AI method that can detect each of land use change overtime as input?	
33	how Satalite imaging in cloudy envirnment give confidence to input.	
34	For faster flood extents using Satellite imagery example, what is the level of open sourceness with focus on data pipelining etc.	
35	I lived through an extreme rainfall/flood event, Lismore, Northern Rivers, NSW. 2.4m above the 2 highest known floods (over 100 yr record). As there are no data points for flood gauge height etc., no data, no idea what the recurrence interval might be. Is there any way that such extreme events might be handled? Can AI help, I think not, as isn't AI an analysis of historic data via web searches? Given climate change, the frequency of extreme events are likely to increase.	I lived through an extreme rainfall/flood event, Lismore, Northern Rivers, NSW. 2.4m above the 2 highest known floods (over 100 yr record). As there are no data points for flood gauge height etc., no data, no idea what the recurrence interval might be. Is there any way that such extreme events might be handled? Can AI help, I think not, as isn't AI an analysis of historic data via web searches? Given climate change, the frequency of extreme events are likely to increase.
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36	Hi I am wondering: 1. Where is the actual mask image (i.e., ground truth) came from? 2. Which Machine Learning algorithm did you use?	
37	My name is Homayoun khoshnod from Afghanistan and I am a General manager of Flood & drought forecasting and warning in the ministry of energy and water (MEW). It's a great opportunity, This is an excellent opportunity for public information on flood modeling at the river basin level. Many thanks	
38	What resolution of satellite dataset is used to present the results? I can see a black n white radar satellite image.	
39	What specific machine learning techniques or algorithms are utilized in your flood extent identification model? How do these algorithms handle the complexities of satellite imagery data and accurately detect flood areas?	
40	What training data was used to develop and validate the machine learning model? How representative is the training data of various flood scenarios and geographical regions?	
41	How does the model differentiate between floodwaters and other similar features like lakes, rivers, or large bodies of water present in the satellite imagery? What measures have been taken to minimize false positive or false negative detections?	
42	What is the accuracy of the flood extent identification achieved by the model? Has it been independently evaluated or validated against ground truth data or existing flood mapping sources?	
43	Does the model have limitations in terms of the size or intensity of the flood it can accurately detect? Are there any specific environmental or contextual factors that may affect its performance?	
44	How does the model handle varying weather conditions, cloud cover, or image quality issues that can impact satellite imagery? Has it been tested across different seasons and weather patterns?	
45	Can the model effectively identify flood extents in different types of landscapes, such as urban areas, dense vegetation, or coastal regions? What challenges or adaptations are required for accurate flood detection in these diverse settings?	live answered
46	Could you please share those questions and answers through emails.?	Could you please share those questions and answers through emails.?
47	Has anyone looked at flood id metrics other than NDWI or manual annotation?	
48	Thankyou for explaining in detail.	
49	can we simulate the water distribution network?	
50	can we reach the presenters via email?	can we reach the presenters via email?
51	can we found todays webinar recording ?	live answered
51	can we found todays webinar recording ?	The recordings will be available on our website and YouTube channel within the next 2 business days. Thank you
52	Can we simulate debris flow using this technique? Naveed from Pakistan.	
53	What is the title of the study?	
54	We see in the media, TV etc., what seems to be more extreme events happening worldwide. Is that the case?	We see in the media, TV etc., what seems to be more extreme events happening worldwide. Is that the case?
55	Will the Flood Extent Data also function as a flood depth map? Will there be More meta data in addition to the flood extent output?	
56	Are the tools open source?	
57	would you share this plugins for Qgis ?	The easiest way is to install the Modeller Interface: https://docs.3di.live/i_guide_modeller_interface.html
58	Excellent presentation. May I ask whether these slides be shared through here or to emails?	
59	Thanks for all of this, just a student trying to understand and practice flood modeling from Mexico, saludos!!	
60	What do you thing about flash flood happened the end of 2021 in Australia but the government of austral can't control or manage on that flash flood?	
61	Hello I was late in accessing the qr code. Where can I answer the survey?	
62	Is not n = 0.022 high for a river?	* sorry 'low' for a river
62	Is not n = 0.022 high for a river?	The 0.022 used for the lower sections of the Brisbane which is a large tidal river. I would argue that this is in the standard range for this type of river.

63	Why should we use TUFLOW over MIKE 11?	
64	can we get the Q&A send to our email?	can we get the Q&A send to our email?
65	How to calibrate TUFLOW?	
66	how many people watched this and how many countries? I want to tell my colleagues.	Yes I was wondering about it too
66	how many people watched this and how many countries? I want to tell my colleagues.	I think we had approximtaly 1,400 people registered from 80 countries :)
67	Excellent recovery when tech failed. Great slides and descriptions thanks. Just one improvement - perhaps the "garbage in garbage out" slide image could be improved. Also loved the example of community involvement, and the boundary placement and differences between volumes of water as they play out	