

Trusted Lingo – a new approach to CALD communications

As the 2019 bushfires closed in on the Greater Sydney region, Shane Fitzsimmons – then NSW RFS Commissioner – went on record¹ to say: ‘Suppression is futile. The focus is on life safety and life protection.’ This statement illustrates the aim of the emergency services: protection of life, the safety of service members and the protection of property.



Tat Banerjee

Our contention is that breakdowns in communication contribute to crisis situations: evacuations remain incomplete; people get trapped; high-risk rescues by service members are required; and, in the worst circumstances, people may die.

What is the problem we are solving?

Research shows that people are slower to process messages not in their native language.² Panic, distress and noises during an emergency can make families with language barriers extremely vulnerable.

Australia has 7 million people who speak a language other than English (ESL – English as a Second Language) at home.³ Of these, approximately 2 million self-identify as having average language skills,⁴ and as many as 750,000 speak little or no English – lower socio-economic bands, recent migrants and refugees make up the latter group.

This equates to between 5% and 15% of the population being at risk of failing to understand instructions under duress during a natural hazard.

It follows then, that while ESL speakers may be able to understand simple instructions in a quiet safe environment, there are questions as to whether English-only messages are the most effective way of alerting them during times of emergency.

‘Certainly, last year when the bushfires happened, most of them here, they didn’t understand how to keep themselves safe from the smoke and what to do in that situation,’ a Rohingya community leader in Victoria was quoted as saying in a 2020⁵ report by the ABC.

More recently, another ABC report during the 2022⁶ floods relayed the

experiences of Syrian immigrant Mohammad Tager, who rang triple 0 to request an evacuation for him and his family but was unable to properly communicate with state emergency services due to limited English skills.

Research by the Bushfire and Natural Hazards Cooperative Research Centre⁷ on building inclusive partnerships with CALD communities called attention to, (a) concepts that might not be understood, such as ‘bushfire survival plan’, (b) framing issues and solutions in a culturally appropriate way, and (c) differences between spoken and written languages.

The importance of ensuring CALD people are not left behind during times of emergency was brought home in the final report from the 2020 Royal Commission into National Natural Disaster Arrangements, which noted: ‘All governments need to continue working together to ensure that the system ... uses the best available technology to improve the communication of warnings across Australia, including to ... people from culturally and linguistically diverse communities.’⁸

How do we solve this problem?

A recent conversation with emergency communications personnel from Infrastructure NSW and the SES offered insights into how some groups are getting around these challenges.

During the floods in western Sydney in 2022, the Chinese Farmers Association of Western Sydney disseminated messages via the WeChat platform, making use of its inbuilt AI translation service.

While this did prove effective, it also highlighted important shortcomings.

While the local president forwarded

Tat Banerjee has Degrees in Engineering (Hons, ANU 2009) and IT (ANU, 2009), followed by a Master’s in Applied Finance (Macquarie, 2016); seven years in currencies and commodities, asset manager and hedge fund sales (State Street Global Markets); current executive with Dandelions, an aerospace start-up putting its first satellite into orbit in 2023; current CEO at VideoTranslator.AI.

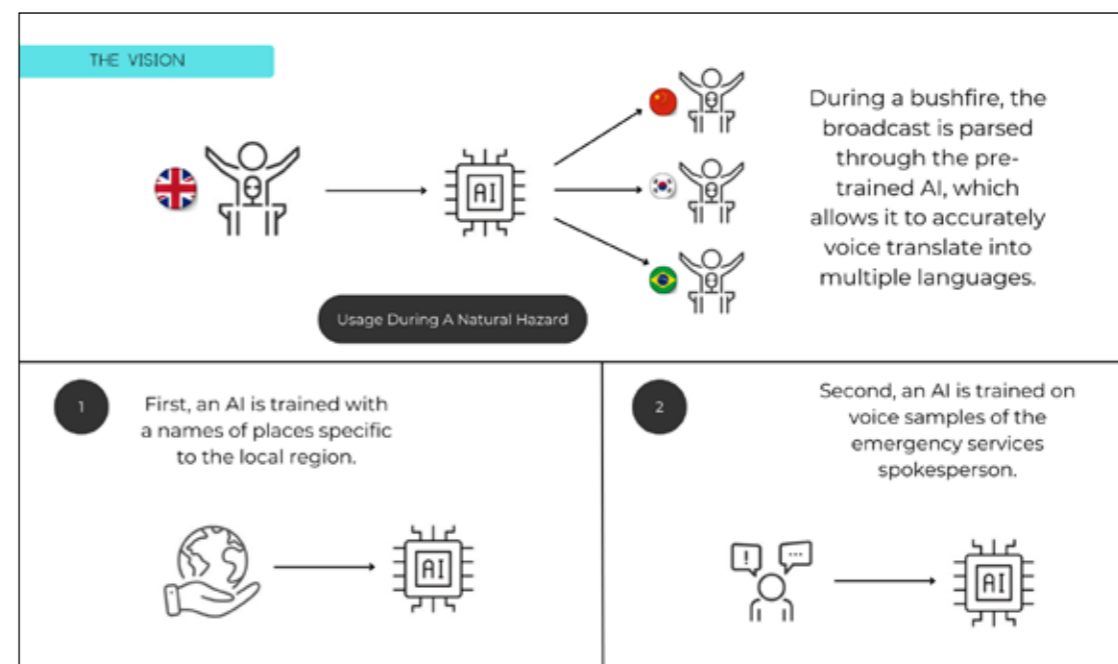


Image 1: The vision, and a two-step process to create a mixture of AI experts.

Image 2: A mock-up Organisation View allows consolidated lists of suburb-specific media channels of ‘local information champions’ where messaging can be auto-delivered in real time.

emergency broadcasts into the WeChat group, questions around the accuracy fuelled confusion, with group chats lighting up with everyone having their say, further muddying the waters, and sometimes leading to inaction.

Anyone who has ever been in a group chat understands how hard it can be to coordinate plans.

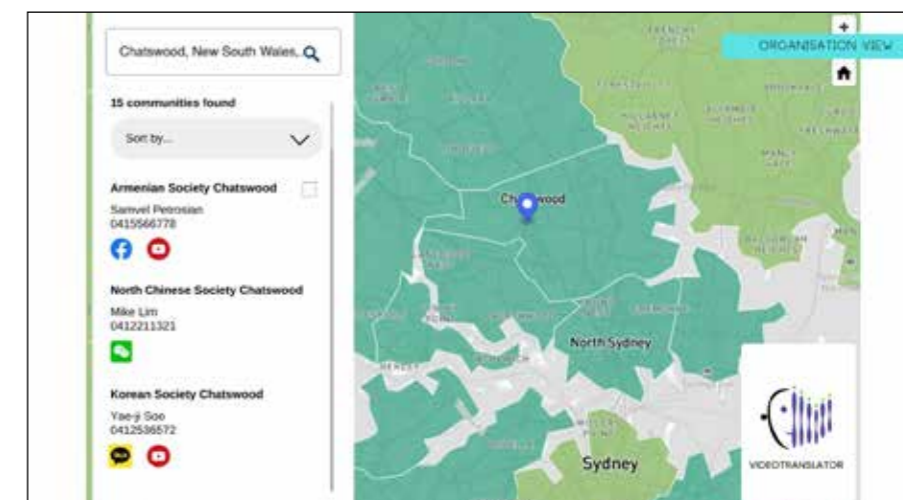
While the translation of emergency alerts must be accurate, they must also lead to correct decisions and swift action.

Our proposed solution, project Trusted Lingo is an academic collaboration between VideoTranslator (a Sydney-based AI firm), Macquarie University (creating robust alert messaging), and the University of Newcastle (assessing end-user behaviour).

So how does it work?

The proposed solution is a custom AI solution for emergency services, which will real-time translate audio, video and text emergency broadcasts into more than 20 languages. Following this, it will use notification services to ‘push’ the audio or video into different social media networks by language.

The end goal is to offer emergency services the ability to tag local language-specific organisations, specific social media groups and local community organisations as ‘local information champions’, and automatically push fully translated audio or video and text communications to them, minutes after a nominated emergency services broadcast occurs.



But will it work?

While modern AIs are often very impressive, the technology still has limitations, as evidenced by incorrect directions via digital map apps and the preponderance of inaccurate translations.

So, how do we address this, both from a performance and risk-management perspective?

Currently, AIs are trained on massive data sets, a complex and expensive process involving significant investments in data annotation, hardware infrastructure and human oversight. A new approach aims to change this ROI.

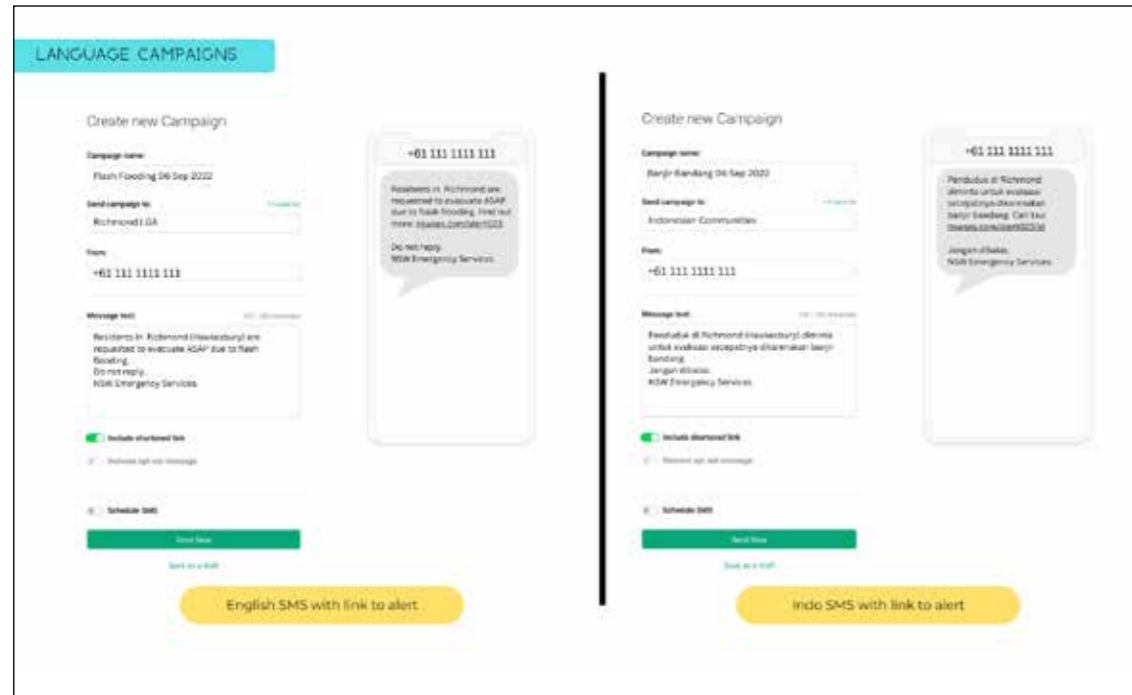
Instead of expensive training of large general AIs, the new approach relies on chaining multiple discrete AI units – an approach known as ‘mixture of experts’ – where small AI units are assembled via a series of gates, resulting in far more predictable outcomes.

Capability 1: audit and reporting

Headed by Macquarie University Associate Prof. Mel Taylor,⁹ an expert in crisis communications within the emergency services, we aim to develop glossaries of (a) emergency services terminology, (b) geographical names from across NSW, and (c) accurate translations – whether technical or phonetic, e.g. Coonabarabran is the same in any language.

Specifically, Trusted Lingo will include the ability to create a custom emergency services nomenclature where previous year emergency broadcasts can be tested for transcription and translation accuracy. The idea is to have a library of old broadcasts and test this against the AI.

Now, we expect the AI will be accurate when used by emergency services, and communications staff will be able to add words to the application to train the AI on an ongoing basis.



◀ Image 3: A mock-up of a Language Campaign to mobile phones listed in the Organisation View.

And while that is good, how do we know if the community will respond positively?

Capability 2: advances in digital trust and efficacy

Associate Prof Kiwako Ito¹⁰ at the University of Newcastle's Lab for Applied Language Science¹¹ (LALS) will explore the second half of this equation.

LALS will assess the level of engagement and efficacy of the end-users of the proposed system. Using eye tracking, the team will measure the users' attention to speech and text and assess their comprehension of messages.

For example, a test emergency broadcast can be shown to target language (TL) community members as an English video with or without subtitle (in English or TL), or a TL-dubbed video with or without subtitle. The eye-tracking data will inform which types of messages (e.g. audio vs text) draw viewer's attention. Brief questions that prompt quick decision making would provide measures of 'digital trust'.

The core of 'Trusted Lingo' is hence two-fold: first, to create an auditable and reportable measure of emergency-services-related terminology specific to the NSW context; second, to assess the appropriateness of the service to specific CALD populations.

Our project aims to achieve an accurate, cost-effective, and inclusive alert system for today's highly diverse society.

How will emergency communications staff use this product?

The vision is for a simple web application deployed at crisis communications centres. As a broadcast is completed, the audio or video file is uploaded to the application.

Automatic transcription and translation results in 20 identical files, initially just with translated captions, with the option for 'voiceovers'. These specific language videos can be automatically posted to a predefined list of 'local information champions' – essentially social media channels of community language-based groups – which have been previously canvassed, all in one-click.

A call for collaboration!

While we believe this vision is compelling, and that Trusted Lingo has potential to be groundbreaking, the success or failure of the effort depends largely on whether the product meets the rigorous requirements of emergency services.

Will it be appropriate once deployed? How useful will it be?

To help answer these questions, we're inviting expressions of interest from people and organisations working in emergency services looking to collaborate on early-stage research aligned with their immediate objectives.

If you are interested in getting involved, please send an email to natural.hazards@videotranslator.ai – and we will come back to you with more information.

We are especially keen to hear from

crisis communications practitioners, community engagement service members and people engaged with coordination tasks during natural hazards.

We will send out emails detailing the progress made, and the occasional webinar, but your involvement can be as little or as much as you would like.

Your time is very much appreciated.

➔ For more information, go to natural.hazards@videotranslator.ai

References

1. Daily Mail, 11 November 2019 - Sydney bushfires: Map shows suburban areas most at risk | Daily Mail Online
2. Neuropsychological Performance of Native versus Non-native English Speakers | Archives of Clinical Neuropsychology | Oxford Academic (oup.com)
3. ABS Census of Population and Housing, Cultural diversity data summary, 2021 – Table 5
4. ABS Census of Population and Housing, Cultural diversity data summary, 2021 – Table 6
5. Multicultural communities need to be part of Victoria's flood emergency plans, leaders say - ABC News
6. Calls to make bushfire warnings easier to access for Victorians who don't speak English at home - ABC News
7. Bushfire & Natural Hazards CRC, 2021 - building_inclusive_partnerships_with_cald_communities_2021_0.pdf (bnhcr.com.au), Page 10
8. Royal Commission Report - The Royal Commission into National Natural Disaster Arrangements Report | Royal Commission into National Natural Disaster Arrangements
9. Associate Professor Mel Taylor - Mel Taylor — Macquarie University (mq.edu.au)
10. Associate Professor Kiwako Ito - Associate Professor Kiwako Ito / Staff Profile / The University of Newcastle, Australia
11. Lab for Applied Language Science / Research highlights / Cultures, Linguistics, Societies and Human Services / Multidisciplinary groups / School of Humanities, Creative Industries and Social Sciences / Schools / The University of Newcastle, Australia