

Chapter 5 – RECOMMENDATIONS AND CONCLUSIONS

The field of military communications requires the integrated use of speech technology for command, control, and communications. In addition for multinational environments, it is necessary for a wide range of protocols from participating countries to be integrated together for safe and effective operations. Speech technology offers the promise of more direct and effective communications, verification of personnel, and allowing operators to have seamless access to information. Previous projects by this group [1] have shown that the problem of non-native speech raises a serious obstacle for the transition of commercial off-the-shelf (COTS) speech technology for speaker recognition, speaker verification, synthesis, and coding. Studies conducted as part of this project by participating NATO laboratories and reported here suggest that performance of COTS speech technology is degraded even more when that non-native speaker is in a stressful, noisy environment characteristic of most military environments. Advances in basic research to address this problem have not kept up with the demand for more widespread application of speech technology. It is hoped that this report will serve to focus the speech community on the important issue of speech and language variability due to non-native speech in battlefield environments. Databases collected during this study have been distributed to all participating NATO countries and some databases are available in CD-ROM format for those interested. Below we summarize the main finding and recommendations.

- 1) Military operations are often conducted in which multi-national coalition partners must communicate in a non-native language. These conditions are known to cause problems especially in stressful, noisy military environments.
- 2) These factors are detrimental to the effectiveness of communications in general, as well as to the performance of communications equipment and weapons systems equipped with vocal interfaces (e.g., advanced cockpits, command, control, and communications systems) trained for the native language.
- 3) Commercial off-the-shelf speech recognition systems are not yet able to address the wide variability associated with a non-native speaker.
- 4) Progress in the field of military-based speech technology has been restricted due to the lack of availability of databases of non-native speech in a military communications scenario.
- 5) It is certain that in the future it will be necessary to improve the coordination and effectiveness of multi-national military forces. The need therefore exists for planned simulations and exercises requiring coordinated emergency and/or emergency personnel using a wide range of speech technology. Such settings will have to address effective communications between multi-national forces using the same speech systems.
- 6) The success of the four-year effort by IST-031/RTG-013 has underlined the necessity to further invest coordinated international effort to support NATO interests in understanding speech production and perception and our ability to implement speech systems that are robust to the realities of everyday military speech.

5.1 REFERENCES

- [1] “Implications of Multilingual Interoperability of Speech Technology for Military Use”, RTO-TR-IST-011, September 2004. <ftp://ftp.rta.nato.int/PubFullText/RTO/TR/RTO-TR-IST-011/TR-IST-011-02.pdf>.

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