**Automatic Speech Recognition**

What we have accomplished?

* Built an automatic large vocabulary continuous speech recognition (LVCSR) system to convert speech to text on-the-fly. LVCSR system is based on context-dependent hidden Markov model.

Why is it useful?

* Useful for automatic annotation of multimedia data consisting of audio only or audio-visual information. Overcomes manual annotation procedures which are tedious and expensive

What is our corpus?

* Our LVCSR system was trained and tested on news broadcasts in Illinois covering a wide range of topics such as politics, weather, education, sports, obituary etc.
* Speaking style of news readers somewhere between read versus spontaneous

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| --- | --- | --- |
| **Item** | **Train** | **Test** |
| Audio Data Size  Total Words  Unique Words  OOV (out-of-vocab) words  Unique OOV words  OOVs per 100 words  OOVs per min. of audio | 117 min  22051  3925  320  180  1.45  2.74 | 25 min  4613  1444  85  45  1.84  3.40 |

Performance of LVCSR system:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Total Words Tested** | **Words incorrectly detected by LVCSR** | **Word Error Rate** | **Insertions** | **Deletions** | **Substitutions** |
| 4613 | 1983 | 43 % | 409 | 230 | 1344 |

Examples of True vs LVCSR hypothesis:

1. True: *!SIL MEMORIALS MAY BE MADE TO THE G. C. M. S. EDUCATION FOUNDATION OUR LADY OF LOURDES CATHOLIC CHURCH OR WESTMINSTER VILLAGE IN BLOOMINGTON !SIL*

LVCSR: *!SIL MEMORIALS MAY BE MADE TO THE* ***SHE SEE*** *M. S.* ***AT TO KITCHEN*** *FOUNDATION OUR LADY OF LOURDES CATHOLIC CHURCH OR* ***WEST CONCERN*** *VILLAGE IN BLOOMINGTON !SIL*

1. True: *!SIL EVERYONE IN THE WORKFORCE UNION AND NON UNION ENJOYS THE FRUIT OF WHAT ORGANIZED LABOR HAS FOUGHT FOR AND WON OVER THE YEARS !SIL AS J. F. K. SAID A RISING TIDE LIFTS ALL BOATS !SIL*

LVCSR: *!SIL EVERYONE IN THE WORK FORCE UNION* ***ON*** *UNION* ***IN TO WASTE AFRAID*** *OF WHAT ORGANIZED LABOR HAS* ***FIVE*** *FOR* ***AN ONE OF*** *THE YEARS AS* ***STAFF KAYE SAD OF RAISING TIRED THAT SOLD LET'S*** *!SIL*