DARPA
DARPATech
2002 Symposium
Transforming
Fantasy

Human Language Technology TIDES, EARS, Babylon

Charles L. Wayne

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Human Language Technology

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TIDES

Translingual Information Detection, Extraction and Summarization

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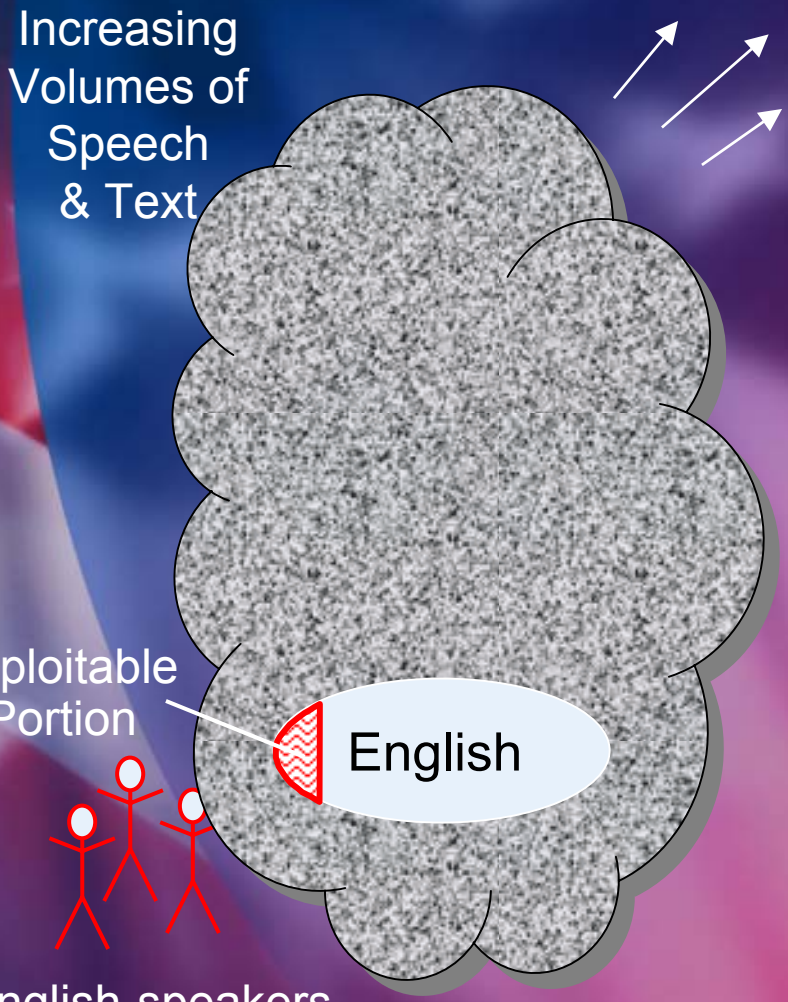
Before TIDES



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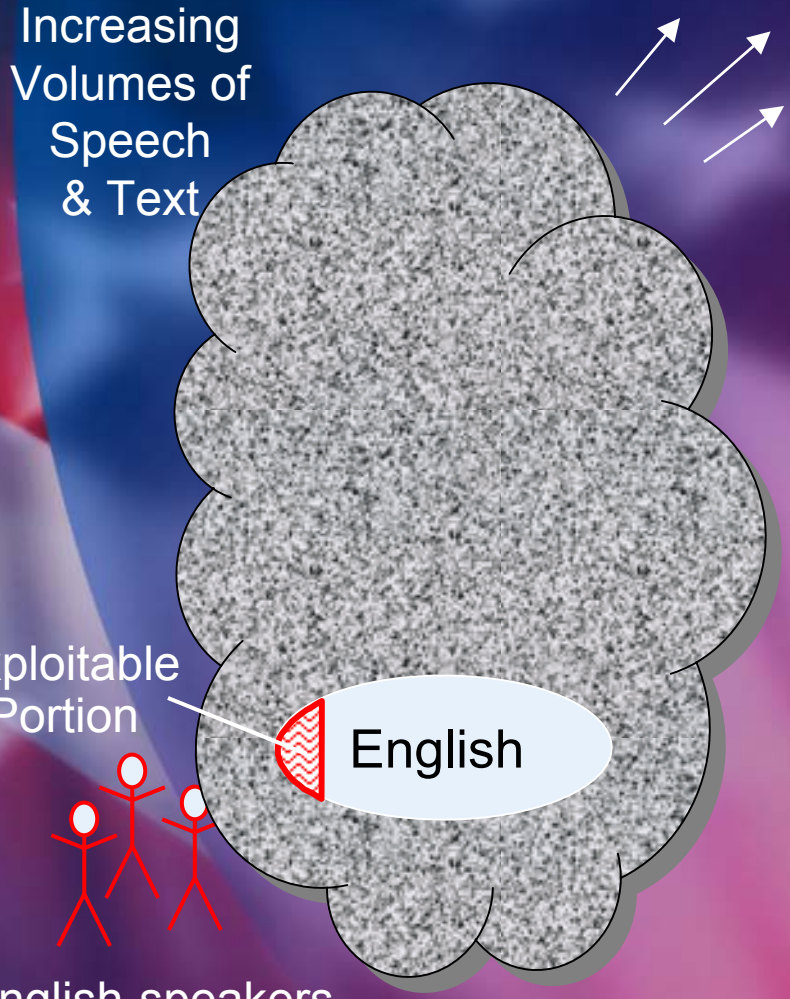
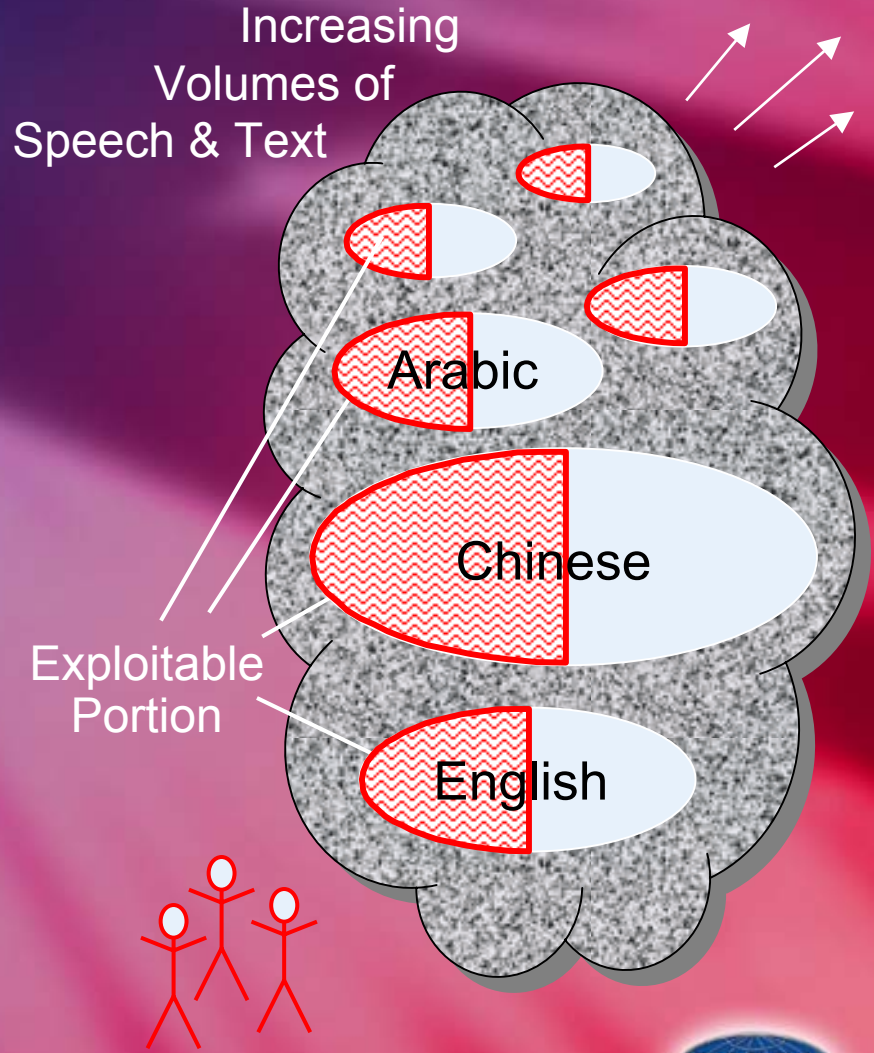
Before TIDES



After TIDES



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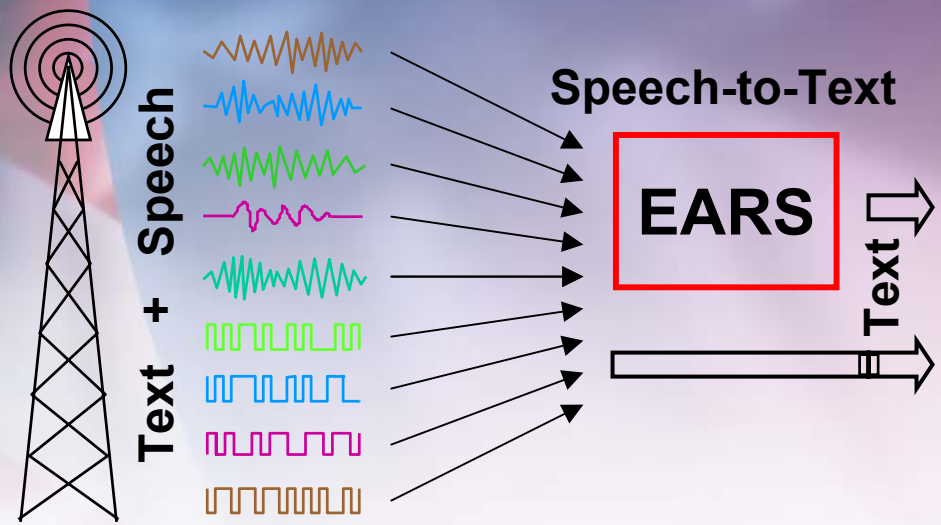
Goal

Multiple Media
Multiple Sources
Multiple Languages



Streaming, Changing
Huge Volumes

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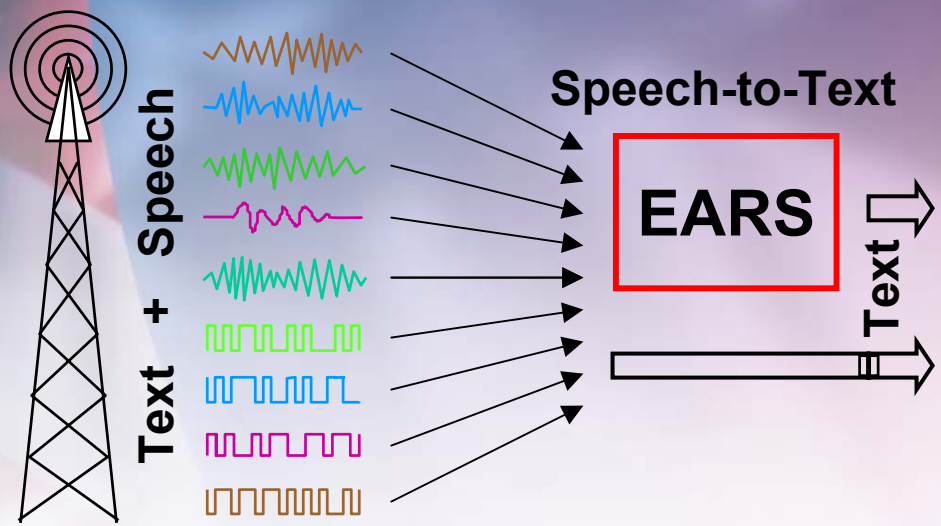
Goal

Multiple Media
Multiple Sources
Multiple Languages



Streaming, Changing
Huge Volumes

Policy Makers
& Warfighters

English-speaking
operator/
analyst

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Goal

Multiple Media
Multiple Sources
Multiple Languages

Policy Makers
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English-speaking
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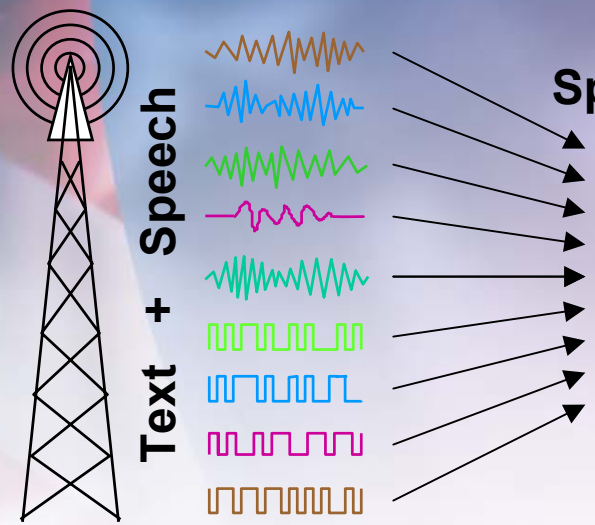

Speech-to-Text

EARS

Text

TIDES

Critical
Information
(in English)

Streaming, Changing
Huge Volumes

English Speakers Able to Find & Interpret Mission-Critical Information

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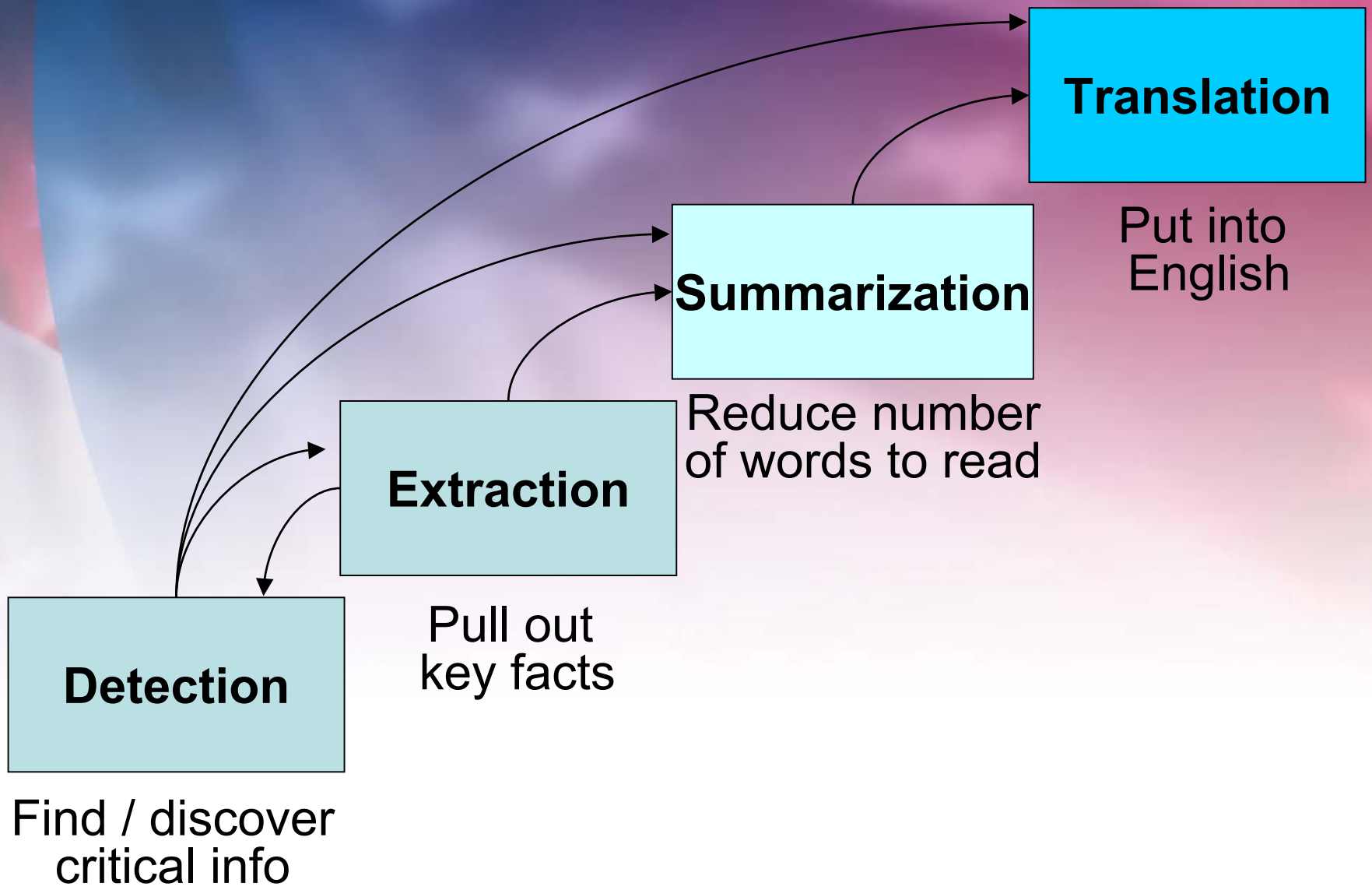
Component Technologies



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Research Progress

- Detection
  - Cross-language information retrieval
  - Topic tracking
  - New event detection
- Extraction
  - Entities
  - Relationships
- Summarization
  - Document compression
  - Cluster description
- Translation
  - Novel approaches evaluation

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Languages

English
Chinese
Arabic

Principal focus

Ultimate goal:
Cheap/rapid porting to new languages

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Technology Integration, Experimentation, Transition

- Text and Audio Processors (TAP systems)
- Experiments on real-world problems with real data and real users
- Transition of successful technology

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Systems Developed

- Open Audio Source Information System (OASIS)
- On-Line Text and Audio Processor (OnTAP)
- MITRE Text and Audio Processor (MiTAP)

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Integrated Feasibility Experiments

- IFE – Bio
- IFE – Arabic
- IFE – Translingual

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EARS to the World

Effective, Affordable, Reusable Speech-to-Text

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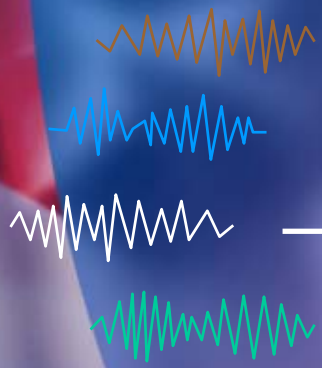
Powerful speech-to-text technology



Human-human speech

Rich Transcription

Multiple Applications

WORDS + METADATA

Rich transcript

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Payoff

- Enormous force multiplier –
  - Machines able to
    - –Detect much better
    - –Extract, summarize, translate
  - Humans able to
    - –Read & understand easily, quickly

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BABYLON

Two-way speech-to-speech translation
for the combat environment

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Speech-to-Speech Translation

One-Way

Phrase recognition, playout
Used in Kosovo, Afghanistan
("Phraselator")

One-plus-One-Way

Enable English-speakers to understand others

Two-Way

Greater freedom of expression

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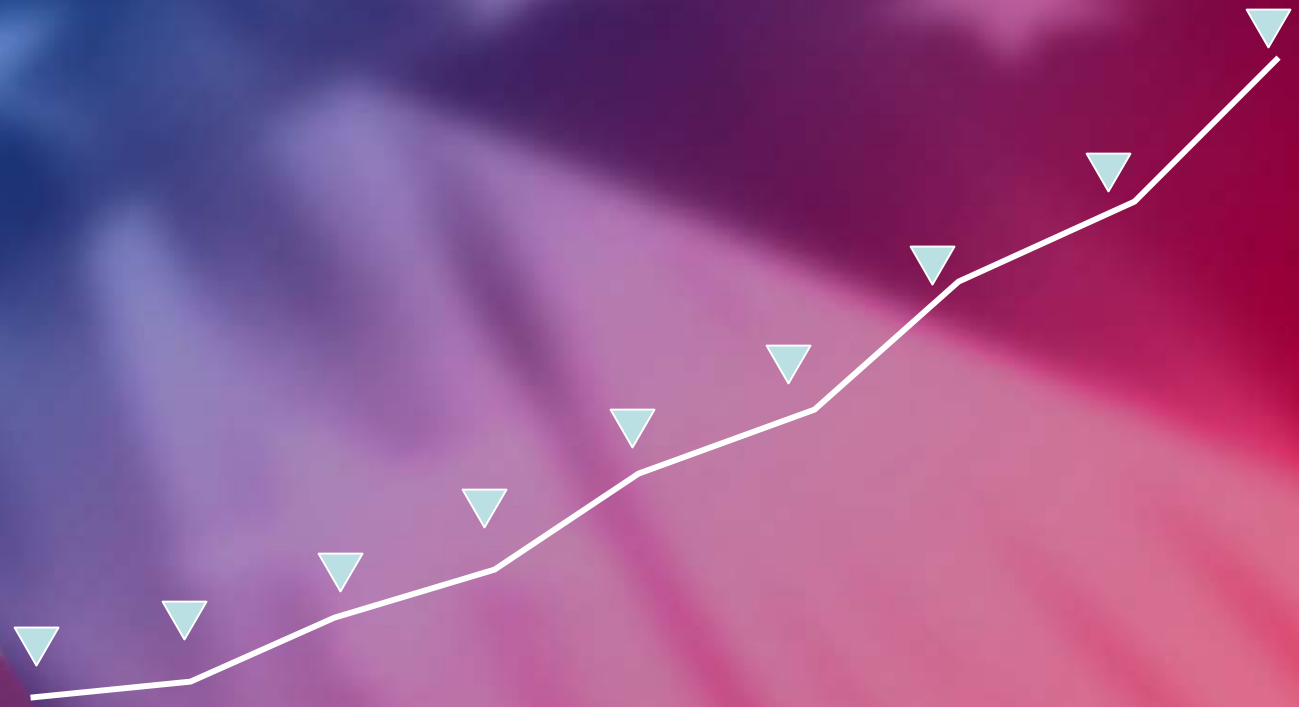
Objective Evaluations Drive Progress



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Key Evaluations

- Rich Transcription
- Information Retrieval
- Topic Detection & Tracking
- Automatic Content Extraction
- Summarization
- Machine Translation

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Summary

- Human Language Technology
  - Key enabler
  - Hear, read, understand
  - Total Information Awareness
- Key Programs
  - TIDES
  - EARS
  - Babylon
- Evaluation

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