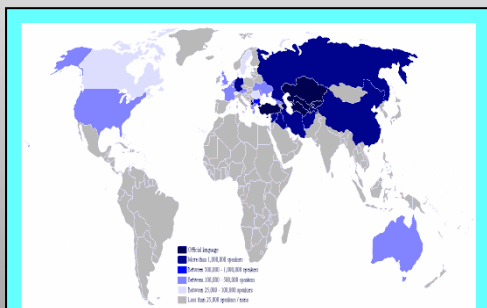




Multimedia Technologies Research and Development Laboratory

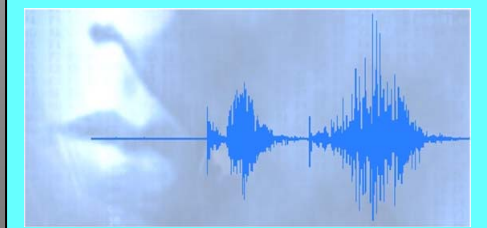


MTRD, UEKAE



Understanding

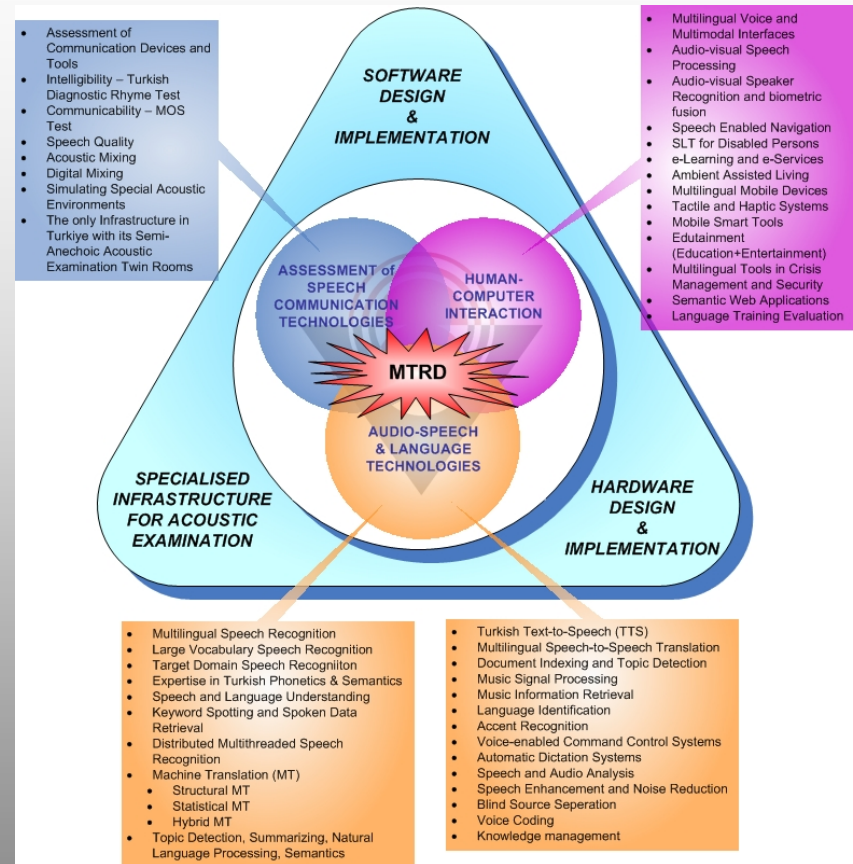
Turkish...



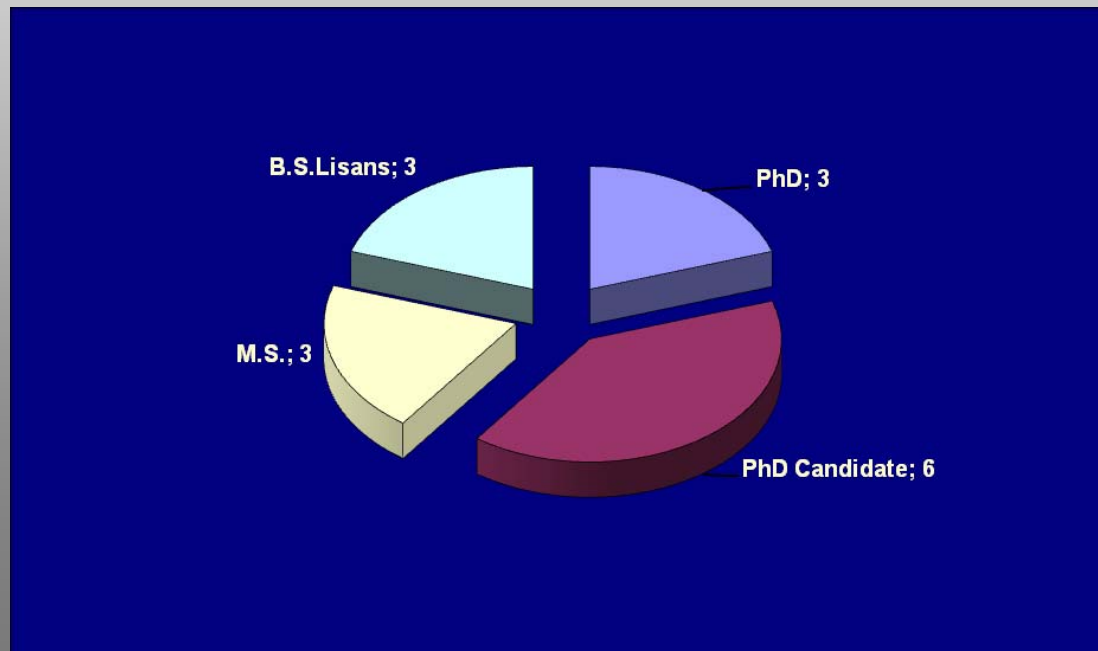
Mehmet Uğur Doğan

MTRD@uekae.tubitak.gov.tr

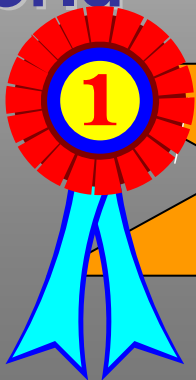
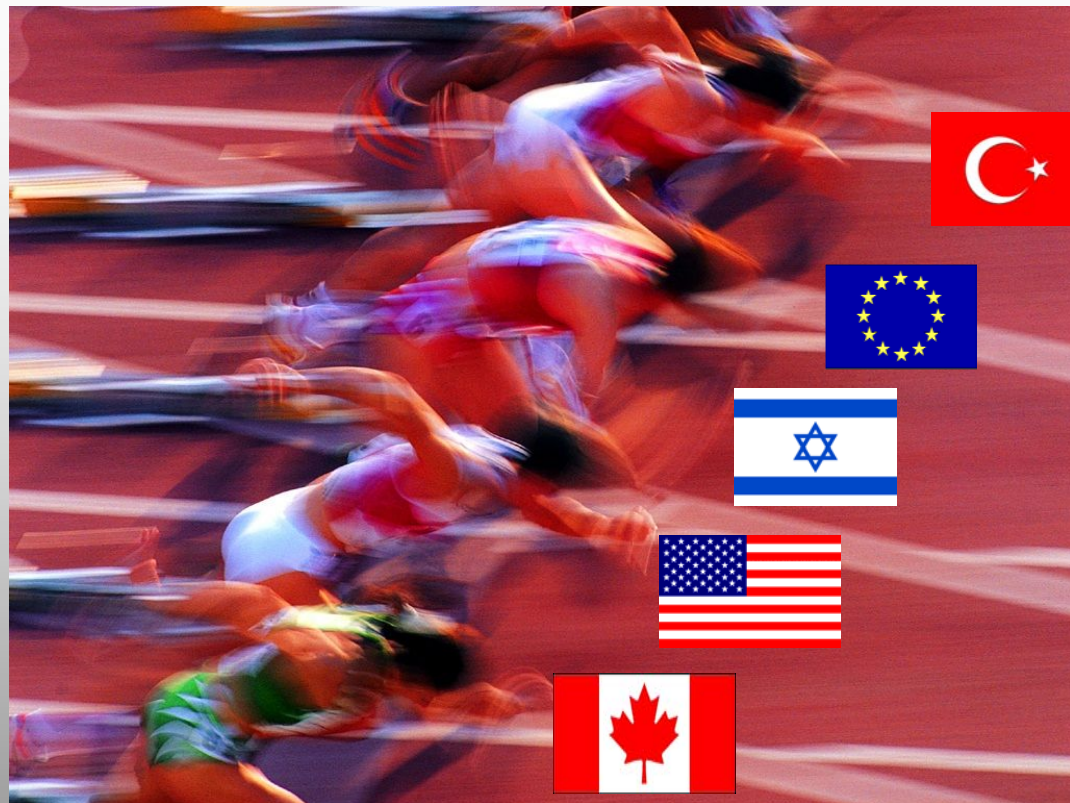
- To assess speech enabled human-computer interfaces and speech communication devices
- To produce practical tools for voice-activated and speech-enabled applications
- To improve the existing R&D capacity of MTRD in the fields of Speech and Language Technologies.



- MTRD Team:
 - 15 Researchers, Electronics Engineers and Computer Scientists,
 - Ph.D.'s and Grads from Top Turkish and US Universities (Bilkent, Boğaziçi, İTÜ, USC, Univ. of Washington, etc.)



**Capable of
Assessing
Turkish speech
intelligibility
through NATO's
Diagnostic
Rhyme Test,
Unique in the
world**



***We are the only group in Turkey with our
semi-anechoic acoustic rooms known as
one of the 8 infrastructures in the world***

- Some snapshots from MTRD's Acoustic Labs...



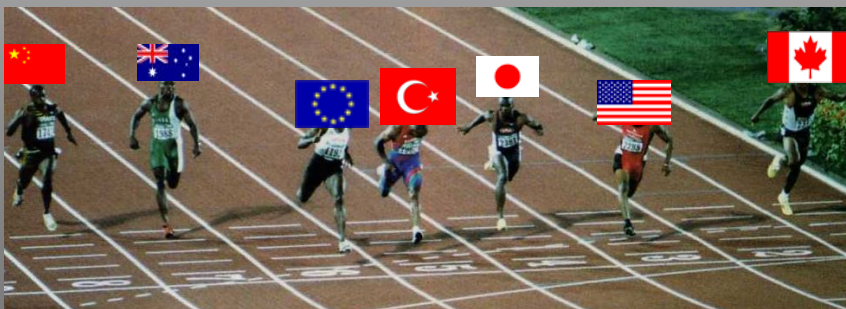
Audience Test Room



Semi Anechoic Chambers



- Ranked in the **first 5** according to NIST 2004 evaluations in large vocabulary speech recognition
- Best scores in large or limited vocabulary **Turkish** speech recognition, keyword spotting and automatic dictation
- Promising results in **noise reduction** and **speech enhancement**



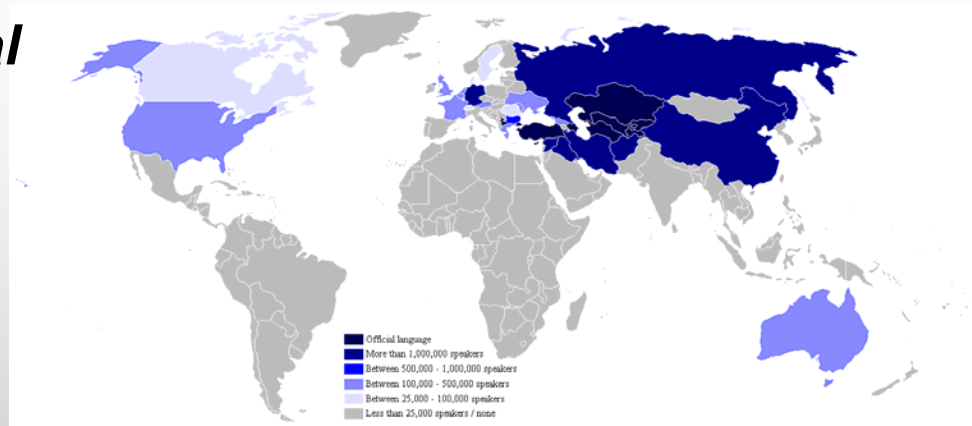
Submarine ambiance

- Ranked in the **first 5** according to NIST 2004 evaluations.
- Special interest on **soft biometrics** in daily speech
- **Promising scores** (less than 3% EER in short acoustic recordings) in very large datasets collected from various acoustic conditions



- ***Top Scores in International Workshop on Spoken Language Translation (IWSLT).***

- 2007: Arabic-English ranked **1st**
- 2007: Japanese-English ranked **1st**
- 2008: Chinese-Spanish ranked **3rd**
- **2009: Turkish-English ranked 1st**
- **2009 TR-EN parallel texts are provided by MTRD!**



Turkic speaking Countries



Ranked first in Turkish MT

- Leadership in **Turkish Speech Synthesis**
- Domain-specific or general-purpose **multilingual text-to-speech** solutions
- Providing know-how about **Turkish phonetics** for research entities in Turkey
- Specialised phonetically balanced **rhyming word pairs** (only available in UEKAE) – **key know-how** for assessing **vocoders**



Leadership in Turkish phonetics

- Special interest on **royalty rights management**
- DRM through **watermarking** and **biometrics**
- Music tracking: Special focus on **Turkish music**
- **Audio copy** detection, **jingle** detection
- **Digital Libraries** and **content management** including musical (audio-visual) content



Fingerprint Verification module

- Privacy preservation through hashing
- High security with UEKAE's original **encryption** algorithms
- Original hardware-based **truly random number generation** that is used for private key generation
- **Key management** and **electronic signature** facility
- Reliability through original **fingerprint** recognition algorithms
- **Match-on-device** (secure embedded technology)
- **AKiS®**; Smart card operating system
- **UKiS®**; Touchless card operating system
- Now in pilot phase!!!



Designed by
UEKAE



Secure card access device

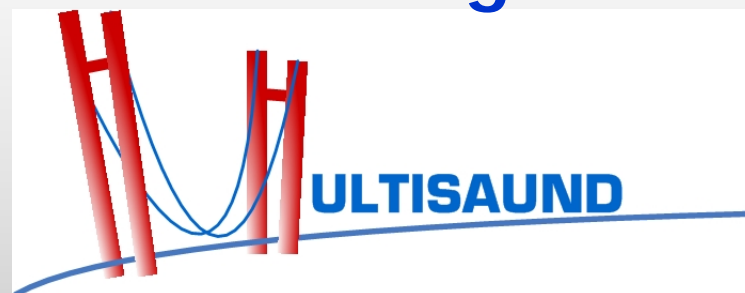
- Turkish Speech Processing Platform, for Turkish Army, finished in June 2009
- Turkey's eID project, now in pilot phase
- Turkish vocoders specific for various communication devices, finished in 2006 (used in MILCEP)
- TREN: Turkish Recognition ENgine: A general purpose engine capable of speech/speaker recognition and behavioural activities detection/classification finished in 2007 (used in various projects)
- Music tracking system for royalty rights management (started in November 2009)
- Automatic Dictation System for Autopsy reporting (Finished in 2008)
- More...

• Project Objectives

- to become one of the **leading RTD groups** in speech and language processing;
- to be a prominent group **especially in Turkish-related systems**;
- to **facilitate and improve** its existing capacity to design and implement new secure and interactive technologies in the related fields;
- to be a **partner of joint networks and projects** in both national and international levels.

Project received full brick (15/15) from the Commission and started in 1st of April, 2009

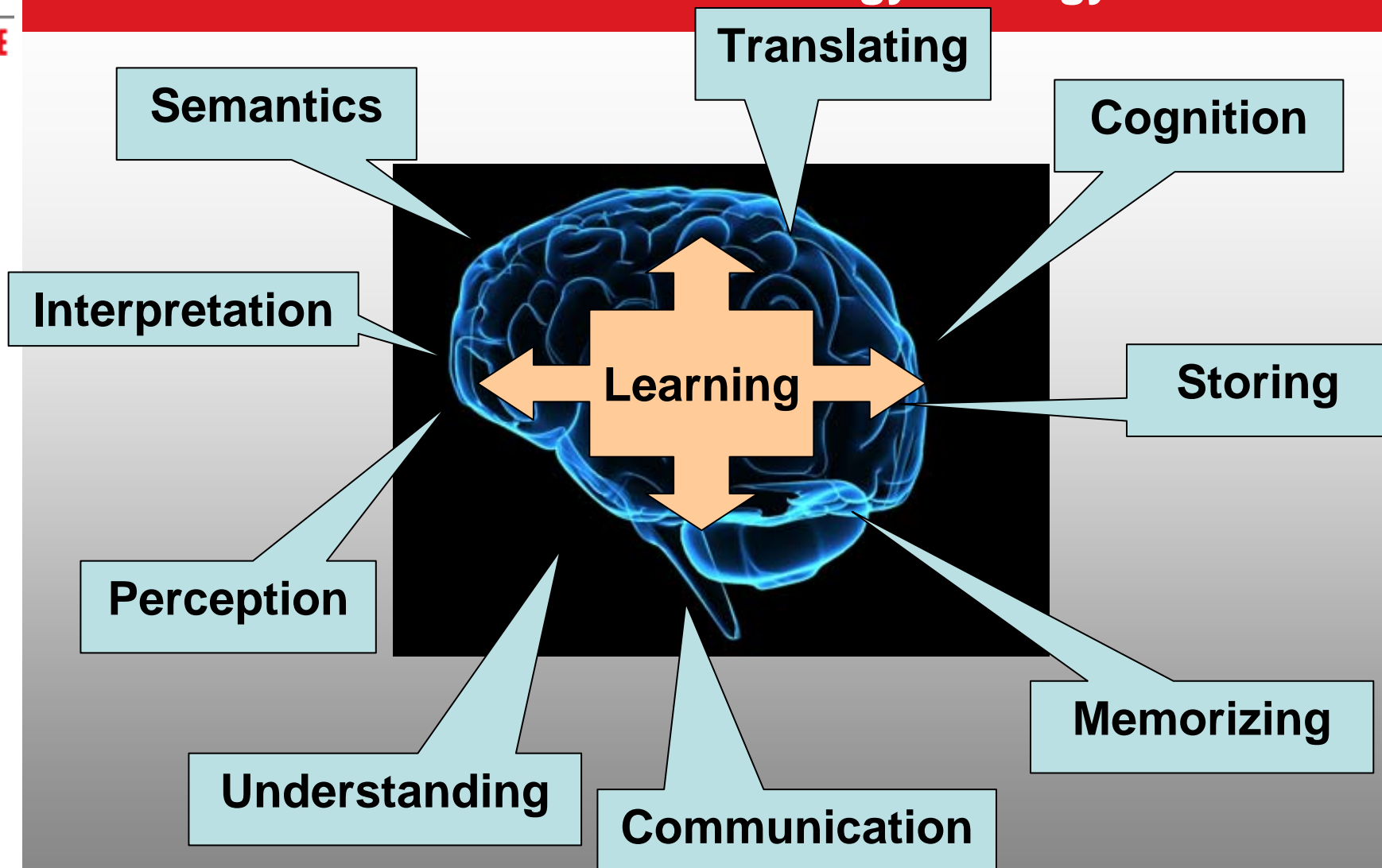
Bridging Multilingual Technologies



www.multisaund.eu

**MULTilingualism
Integrated to Speech &
Audio UNDERstanding**

REGPOT-2008-1



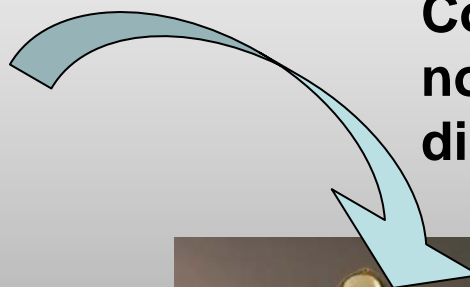
Develop and Improve Technologies about
Brain Functions on Multilingualism

Technologies inherited from Multilingualism:
Computer assisted **non-convergent discourse**.



On the road to C3PO

Androids speaking,
translating and
understanding many
languages



Goal

**Computer-Assisted
non-convergent
discourse**



- We have interest on FP7 and other international bilateral and/or multilateral projects in the related fields through
- FP7 ICT, SEC, ICT-PSP, INFRA, Marie Curie calls including but not limited to
 - Digital libraries, digital content management
 - Multilingual web
 - Future Internet, Trustworthy ICT
 - Ambient Assisted Living, haptic and tactile portable devices
 - Living Labs
 - Digital Cultural Heritage
 - Crisis management
 - Border security
 - Transnational communication
 - eLearning
 - eParticipation and eGovernance
 - etc.
- Other international funds such as ARTEMIS, EUREKA, etc.
- Bilateral consortiums
- Capacity building projects and participation in networking events
- Participation in NoEs or CoEs.

- **Memberships:**

- NATO Speech Group – RTO-IST-078 since 1999
- Linguistic Data Consortium (LDC) since 2008.

- **References:**

- Siemens AG, Germany
- LIMMI, France
- Hitachi-OMRON, Japan
- University of Sassari, Italy
- University of Edinburgh, Scotland
- University of Hamburg, Germany
- Polytechnic University of Valencia, Spain
- Polytechnic Univ. of Catalonia, Spain
- Bilkent University, Turkey
- Boğaziçi University, Turkey
- Sabancı University, Turkey
- Middle East Tech. University, Turkey
- Izmir Institute of Technology, Turkey
- Turkish Army, Turkey
- The State Planning and Organisation Department of the Turkish Prime Ministry



- **MTRD**
Multimedia Technologies
Research & Development
Laboratory

www.uekae.tubitak.gov.tr/mtrd

www.multisaund.eu

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**Understanding Spoken
Turkish language**