

글로벌 ICT 표준 컨퍼런스 2023

Global ICT Standards Conference 2023

(세션1) 미래 핵심기술 표준화를 위한 ISO/IEC 전략/대응

언어지능기술 표준화 현황

최미란 전문위원, 한국전자통신연구원

주최



과학기술정보통신부
Ministry of Science and ICT



특허청
Korean Intellectual
Property Office

주관



국립전파연구원
National Radio Research Agency



Index

01 ISO/IEC SC35 User Interface 그룹

02 ITU-T SG16 Q24 Human Factors for Intelligent User Interface

03 MPAI 사실표준화 그룹

01. ISO/IEC SC35 User Interface 그룹

- 동시통역시스템 표준화 현황
 - 1부 일반사항
 - 2부 요구사항
 - 3부 시스템 구조

02. ITU-T SG16 Q24 Human Factors for Intelligent User Interface

- 생성형 언어지능을 활용한 대화 인터페이스 표준화 현황
- 디지털 휴먼 활용을 위한 사용자 인터페이스와 맞춤형 사용자 특성 정의 표준화 현황

03. MPAI 사실표준화 그룹

- 멀티모달 대화 표준화 현황 (MPAI-MMC)
- 연결된 자율주행 자동차의 인공지능 기반 UI 표준화 현황 (MPAI-CAV)
- 아바타 표현과 애니메이션 표준화 현황 (MPAI-ARA)

언어지능의 개념

Global ICT Standards Conference 2023
글로벌 ICT 표준 컨퍼런스 2023

사람의 언어에 대한 분석, 이해, 생성, 지식화 등을 다루는 기술로서 대표적인 응용 분야는 정보검색/질의응답, 대화처리, 자동번역 등 있음

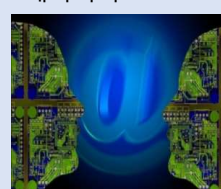
정보검색/질의응답



자동통번역

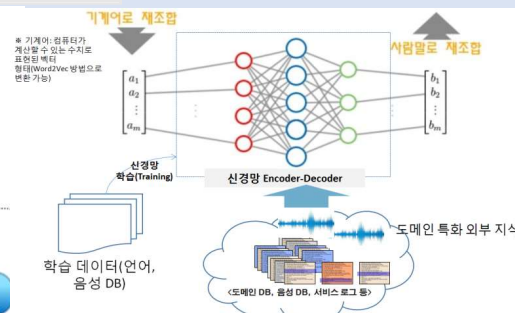


대화처리



.....

소피스트란 그리스어로 지혜로운 자 또는 지혜를 만들어내는 사람이라는 뜻으로, BC 5~4세기의 그리스의 철학자들을 말한다.





ISO/IEC JTC1/SC35 User Interface

ISO/IEC JTC 1/SC 35 User Interface

Global ICT Standards Conference 2023
글로벌 ICT 표준 컨퍼런스 2023

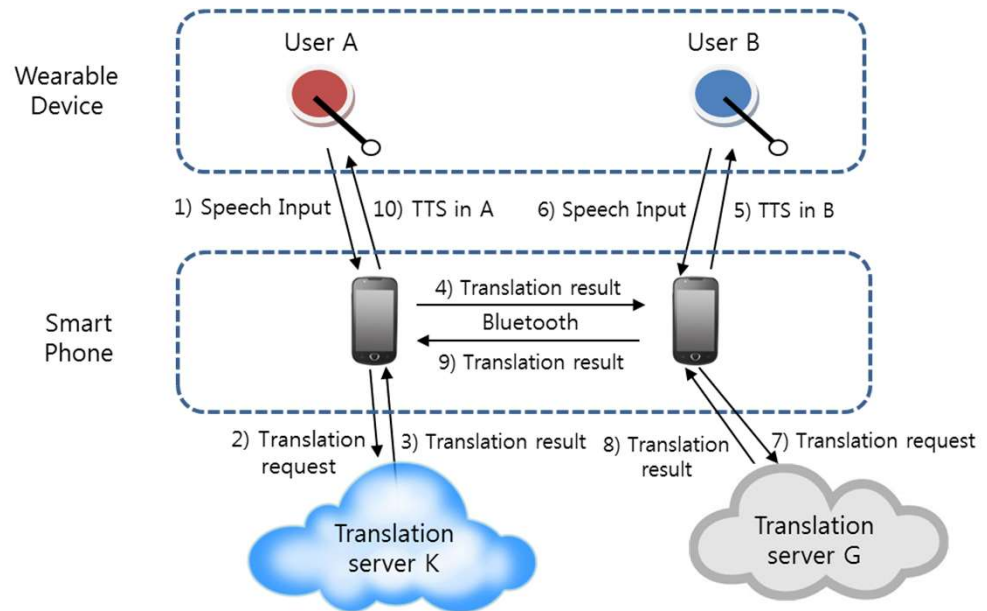
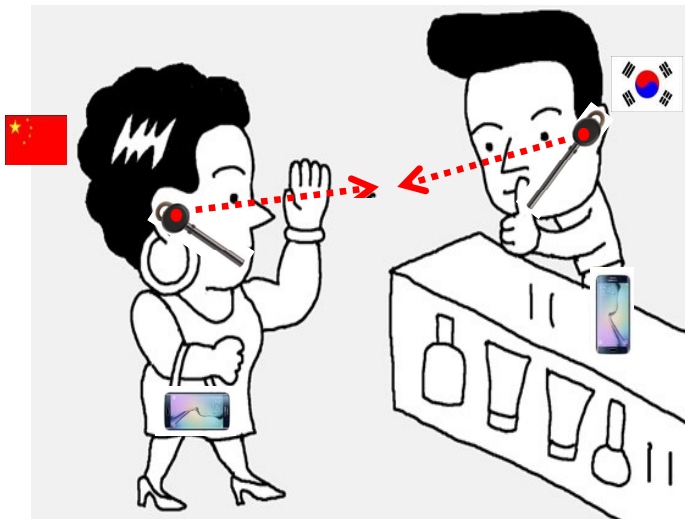
- **Secretariat: AFNOR (France)**
- Creation date: 1998
- Published ISO standards: 84, ISO standards under development : 13
- Members: 19 P-members (participating), 19 O-members (observing)
- Structure: <https://www.iso.org/committee/45382.html>
 - **WG1: Keyboards, methods and devices related to input and its feedback**
 - WG2: Graphical user interface and interaction
 - WG4: User interfaces for mobile devices and wearable devices
 - **WG5: Cultural and linguistic adaptability**
 - WG6: User interfaces accessibility
 - WG7: User interfaces object, actions and attributes
 - WG8: User interfaces for remote interactions
 - **WG9: Natural user interfaces and interactions**
 - WG10: Affective computing user interfaces

자동통역 시스템 표준화

Global ICT Standards Conference 2023
글로벌 ICT 표준 컨퍼런스 2023

표준화 개발

- 표준내용: 대면상황 음성통역시스템의 User Interface와 시스템 표준
- ISO 20382-1 and 2: Face-to-face speech translation
- ISO JTC1 SC35 User Interface 표준화 회의에서 표준 승인 (2017.9) – 평창올림픽에서 활용

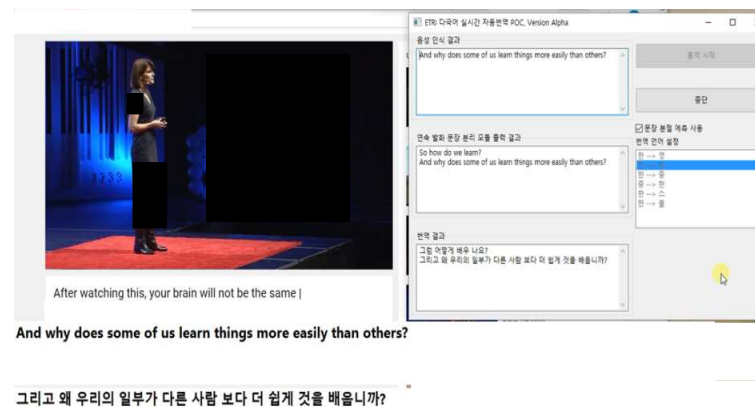
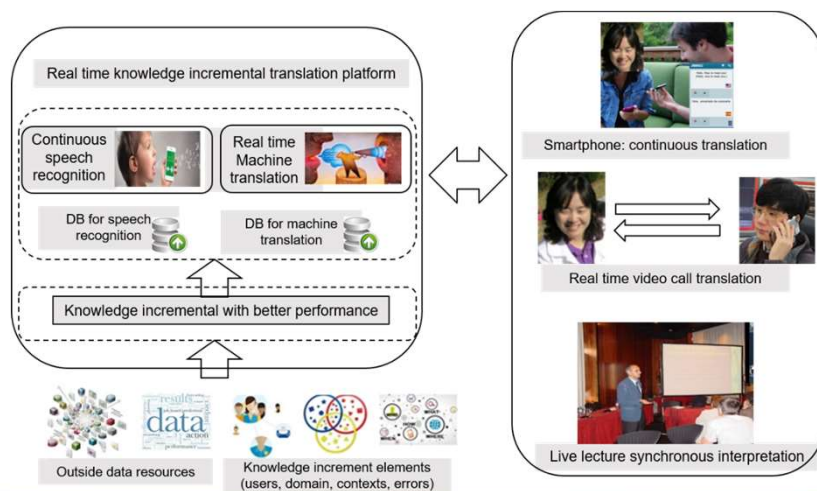


동시통역 시스템 표준화

Global ICT Standards Conference 2023
글로벌 ICT 표준 컨퍼런스 2023

표준화 개발

- 표준내용: 실시간 동시통역시스템의 User Interface와 시스템 표준
- ISO 20773 시리즈 (User interfaces for automatic simultaneous interpretation system)
 - Part 1 - General
 - Part 2 – Requirements and functional description
 - Part 3 – System Architecture
- 동시통역시스템 표준이 3개의 파트(DIS)로 진행 중이며 2023년말 발간 예정





ITU-T SG16 Q24

Human factors for Intelligent User Interface

Q24 진행 표준화 항목

글로벌 ICT 표준 컨퍼런스 2023
Global ICT Standards Conference 2023

하이브리드 워크
환경에서의 효율적인
대화 시스템 요구사항

인터랙티브 가상 공연
예술서비스 프레임워크

고령자를 위한 지능형
사용자 인터페이스
요구사항

수면 관리 서비스를
위한 상호 운용성
프레임워크

재난정보에 대한 메
타데이터

디지털 휴먼
커스터마이제이션
프레임워크

인공감성지능 기반
상담서비스
기능 요구사항 (제정)

지능형 안전진단
시스템 UI 요구사항

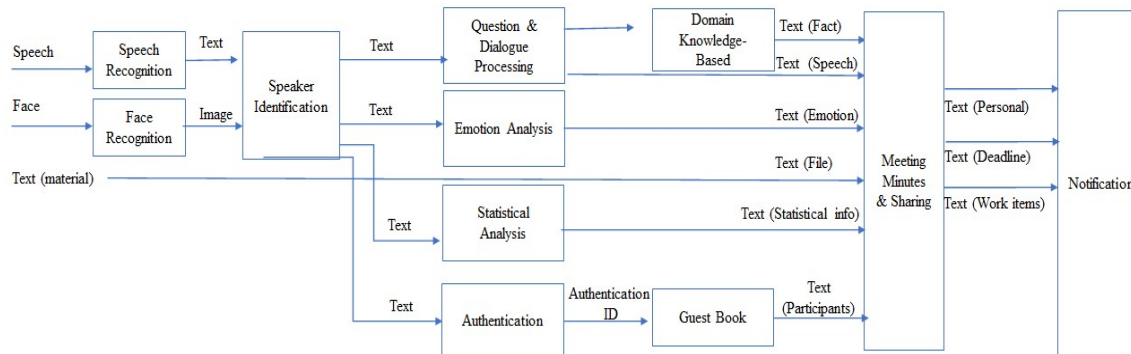
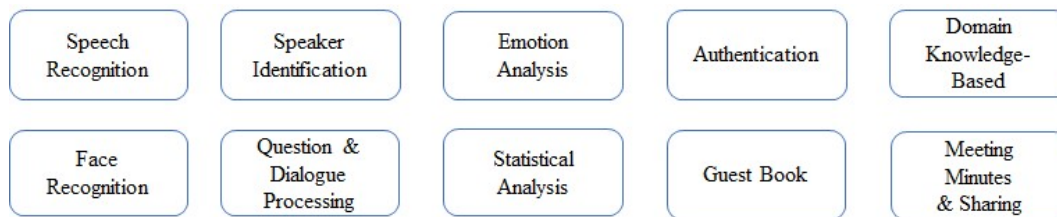
신규: 남극 연구의
안전한 휴먼팩터
서비스 요구사항

신규: VR/AR
환경에서의 제스처
인터랙션 (중국)

신규: 지능형 차량의
HUD 인터페이스
요구사항 (중국)

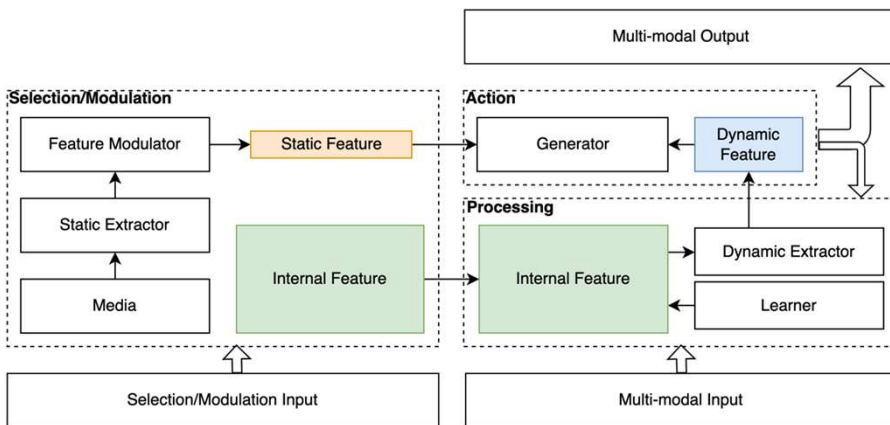
하이브리드 워크 환경에서의 효율적인 대화 시스템 요구사항

- F. ECHO: Requirements for conversation system in a hybrid work environment
- 제안: 한글과 컴퓨터

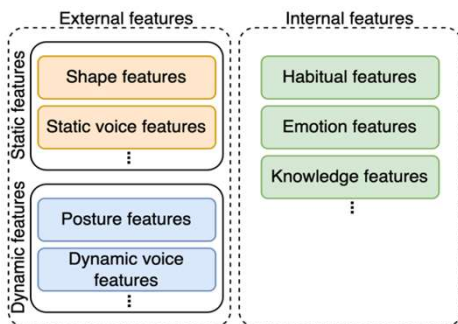


디지털 휴먼 커스터마이제이션 프레임워크

- F. FDHC: Factors and framework for digital human customization
- 제안: 클레온



Digital human customization and interaction framework



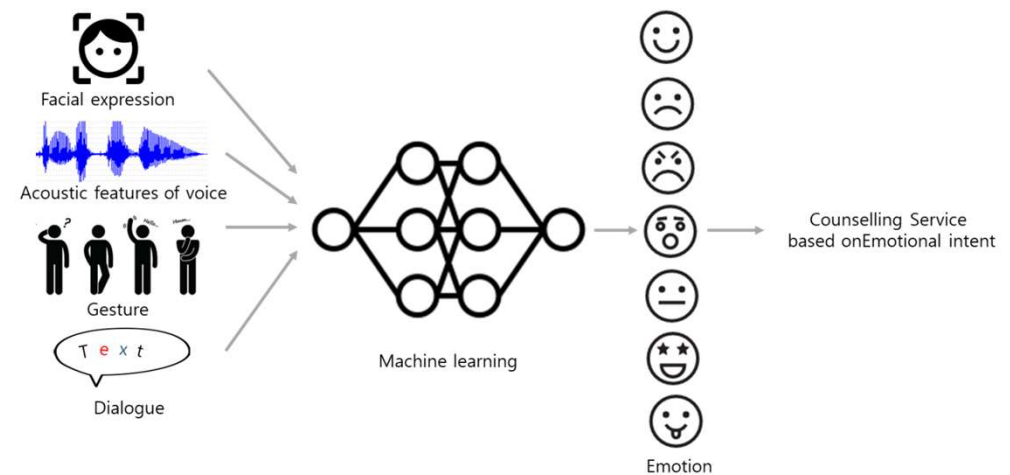
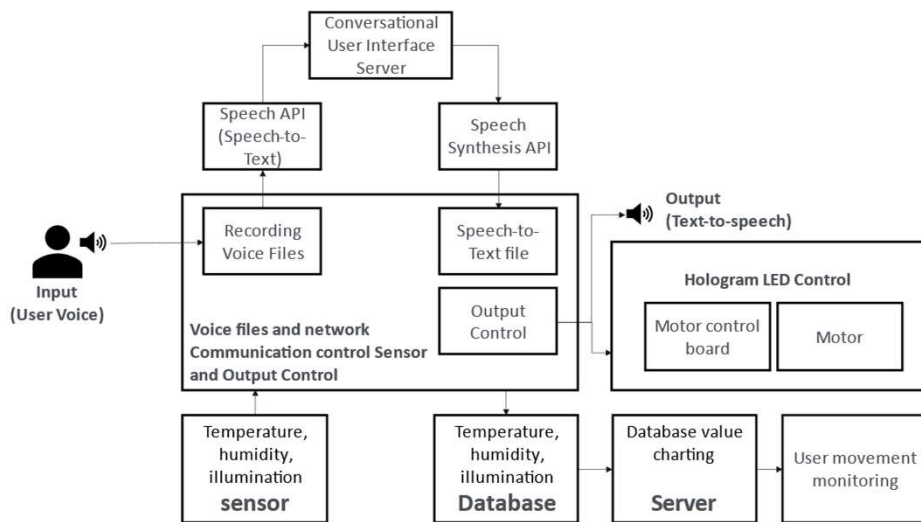
Classification of digital human features

Table 3 – Shape features

Feature	Format / Unit	Description
Facial shape parameters	List of values	A set of parameters determining shape of a face
Hairstyle	Map of parameter values	Map of hair shape parameters along the head area
Body skeleton on tree	(Tree structure)	A directed graph without cycles, consists of joints as nodes and body segments as edges, which defines topology of body.
Length of body segments	cm	Length of body segments
Bendable range of joints	degrees (minimum), degrees (maximum)	Allowed angle between two connected parts along bending axis
Swayable range of joints	degrees (minimum), degrees (maximum)	Allowed angle between two connected parts perpendicular to bending axis
Twistable range of body segments	degrees (minimum), degrees (maximum)	Relative angle of two bending axes of two joints incident with a given body segment, when projected into the perpendicular plane of the segment
Thickness of body segments	cm	Square root of largest cross-section area of a given body segment, multiplied by $2/\sqrt{\pi}$

고령자를 위한 지능형 사용자 인터페이스 요구사항

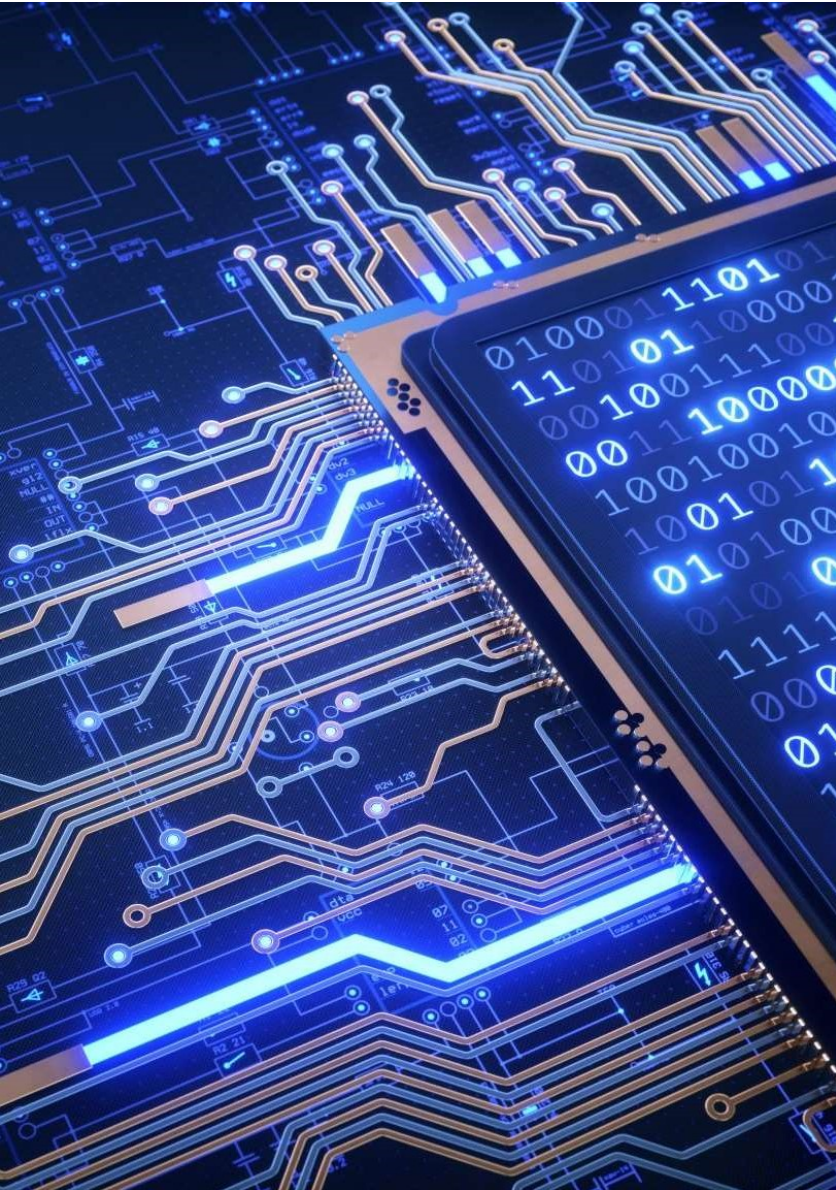
- F. UIES-req: Requirements for Intelligent User Interface services for the elderly
- 제안: MeDiF (한국스마트의료기기산업진흥재단), ETRI



F.CS-AEI 상담서비스요구사항



MPAI 언어지능 표준화 현황



MPAI Moving Picture, Audio and Data Coding by Artificial intelligence

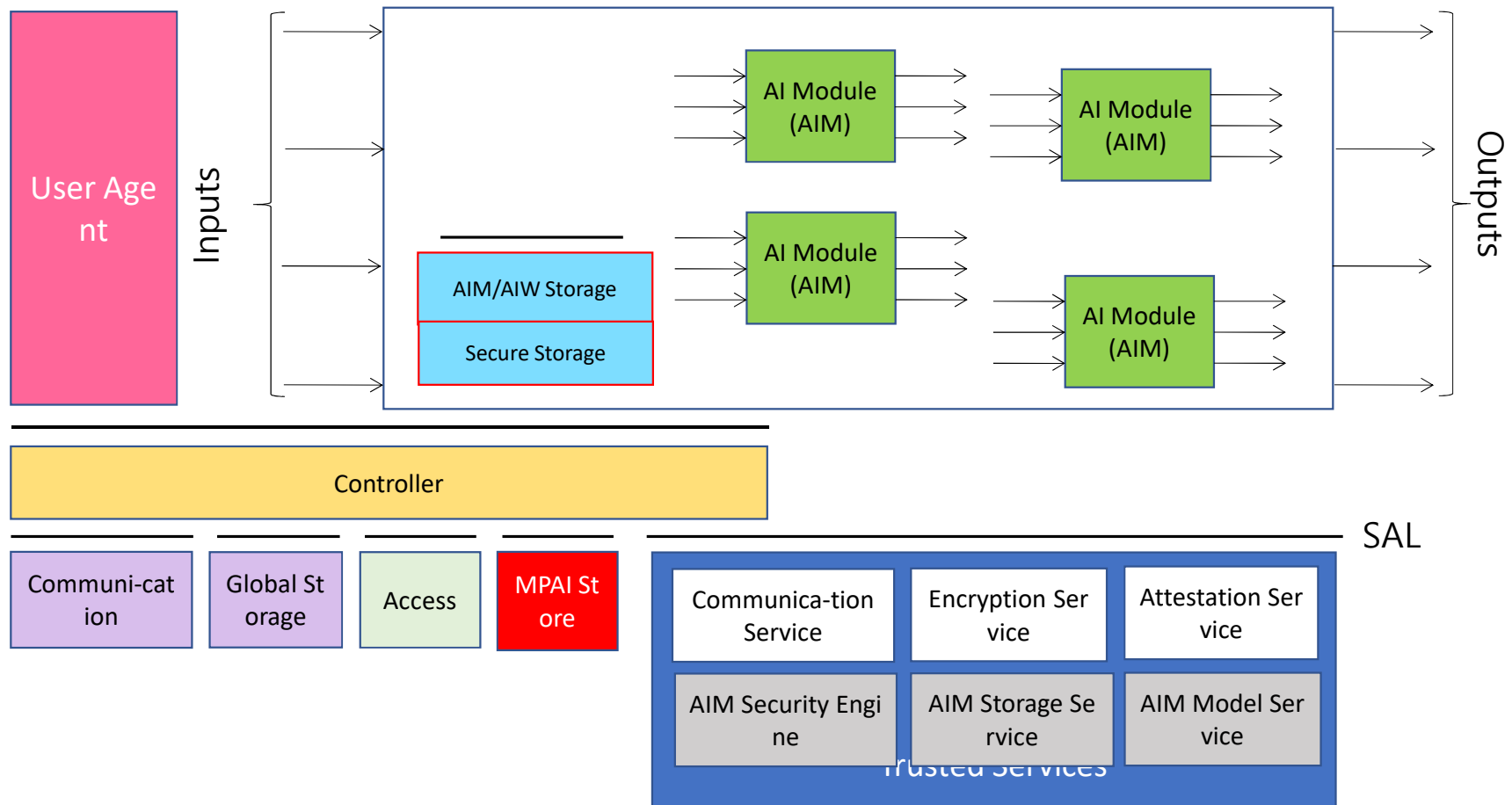
- MPEG 창시자 Leonardo Chiariglione 가 설립한 비영리 국제표준단체
- AI 에 기반한 데이터 코딩 표준 개발 목표
- 2020년 9월 30일에 창립총회를 마치고 사실표준화 그룹 선언
- 현재 15개 국가의 40 개의 단체회원
<https://mpai.community>

*Data coding: the **transformation** of data from a **format** into another format more suitable to an application.



AI Framework (MPAI-AIF)

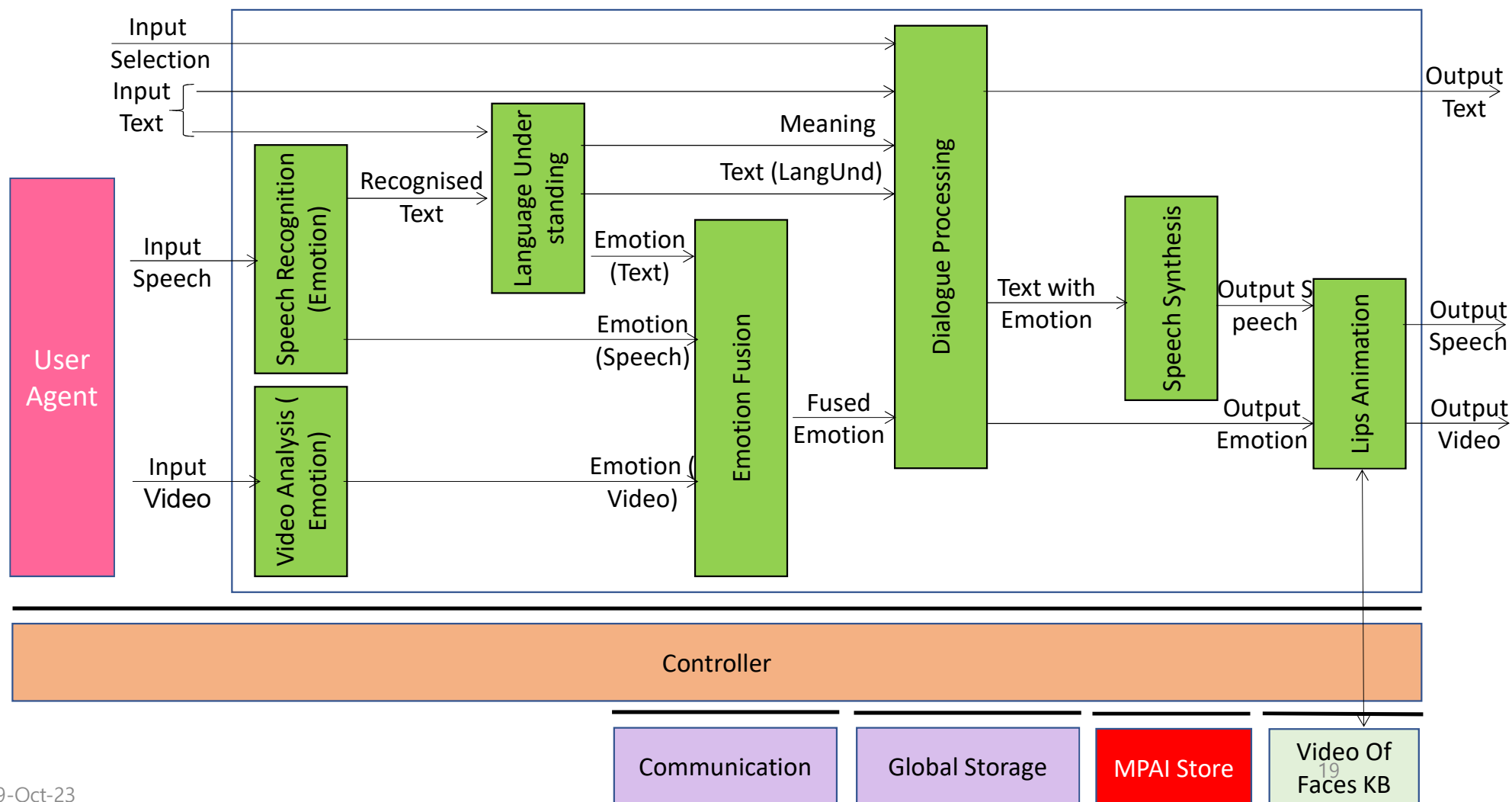
MPAI-AIF V2 Model



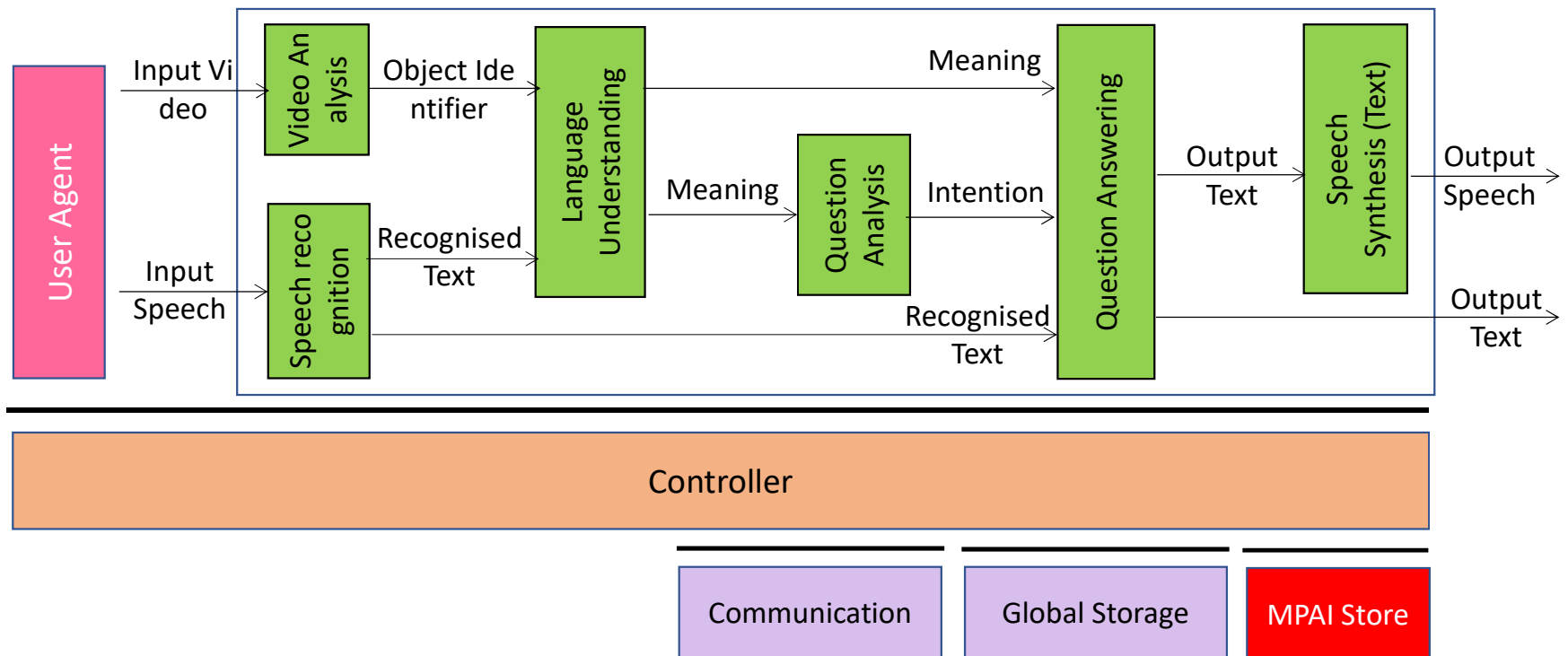


Multimodal Conversation (MPAI-MMC)

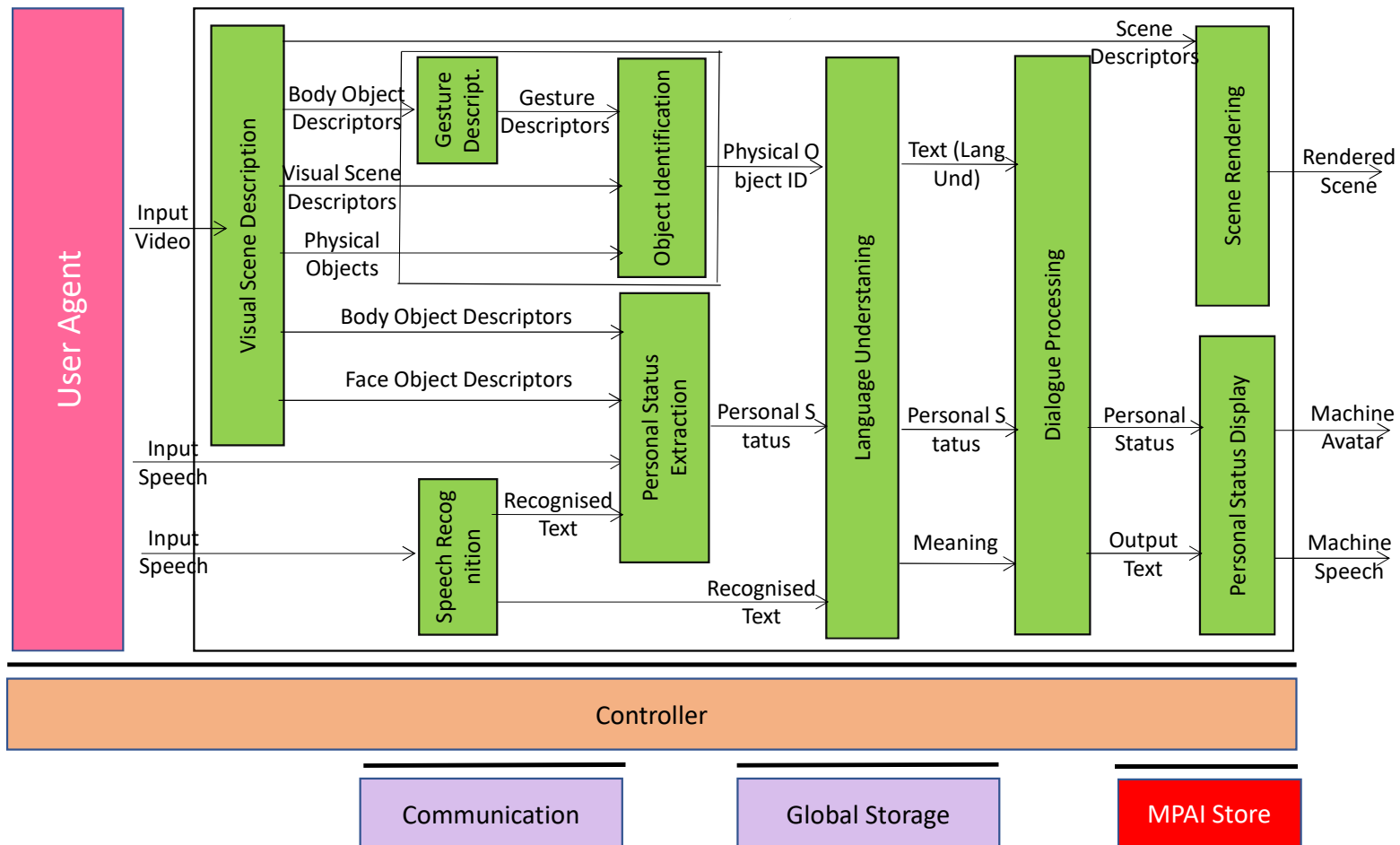
Conversation with Emotion



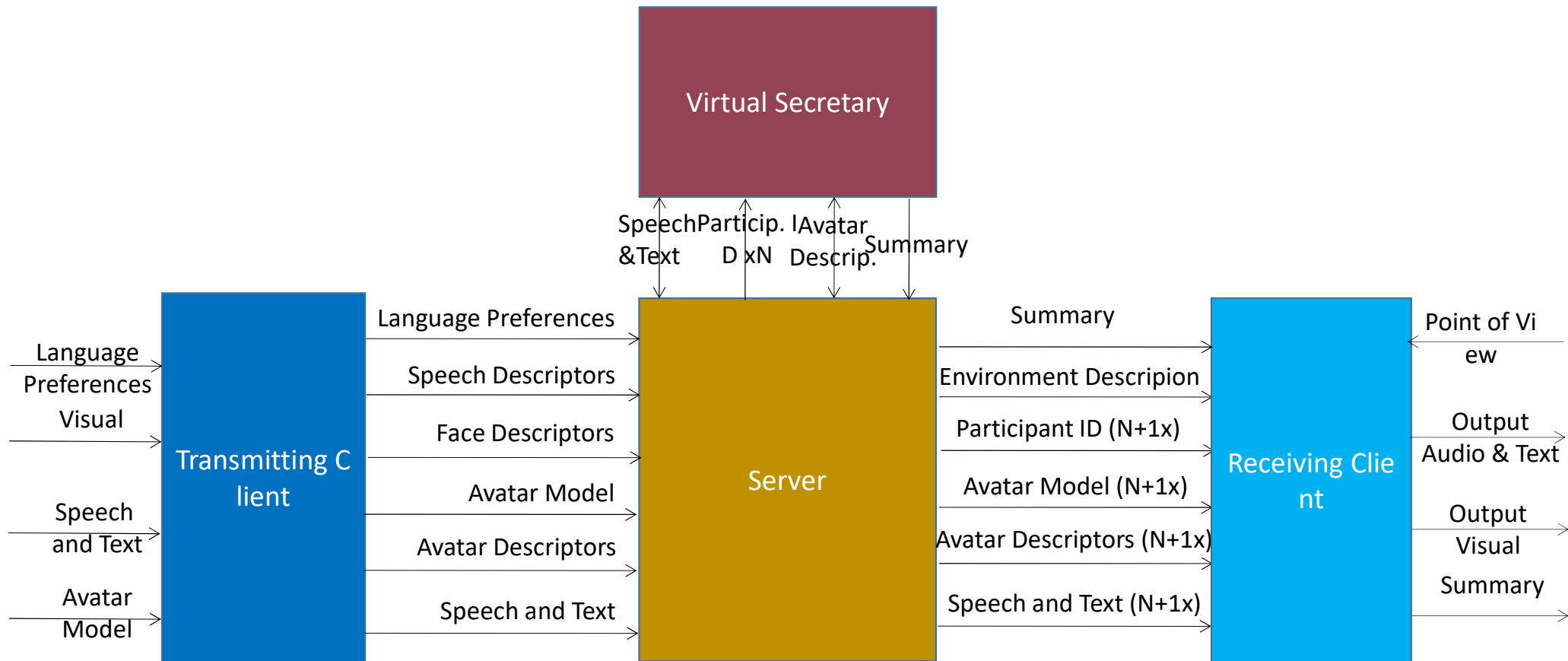
Multimodal Question Answering



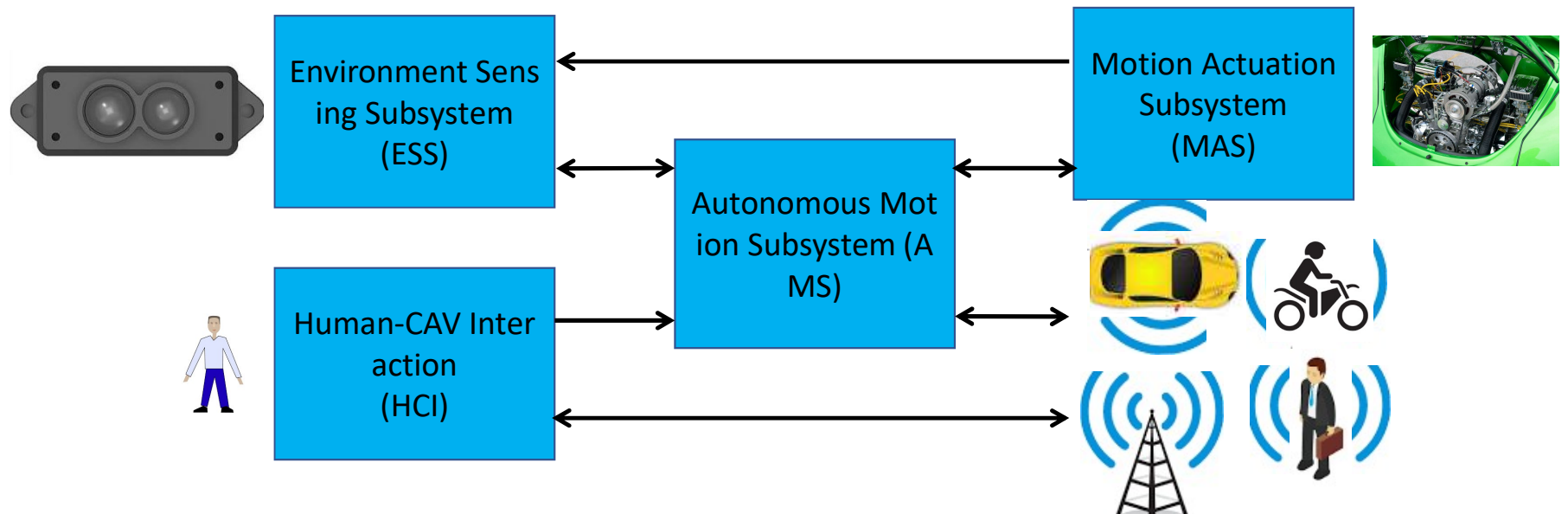
Conversation About a Scene



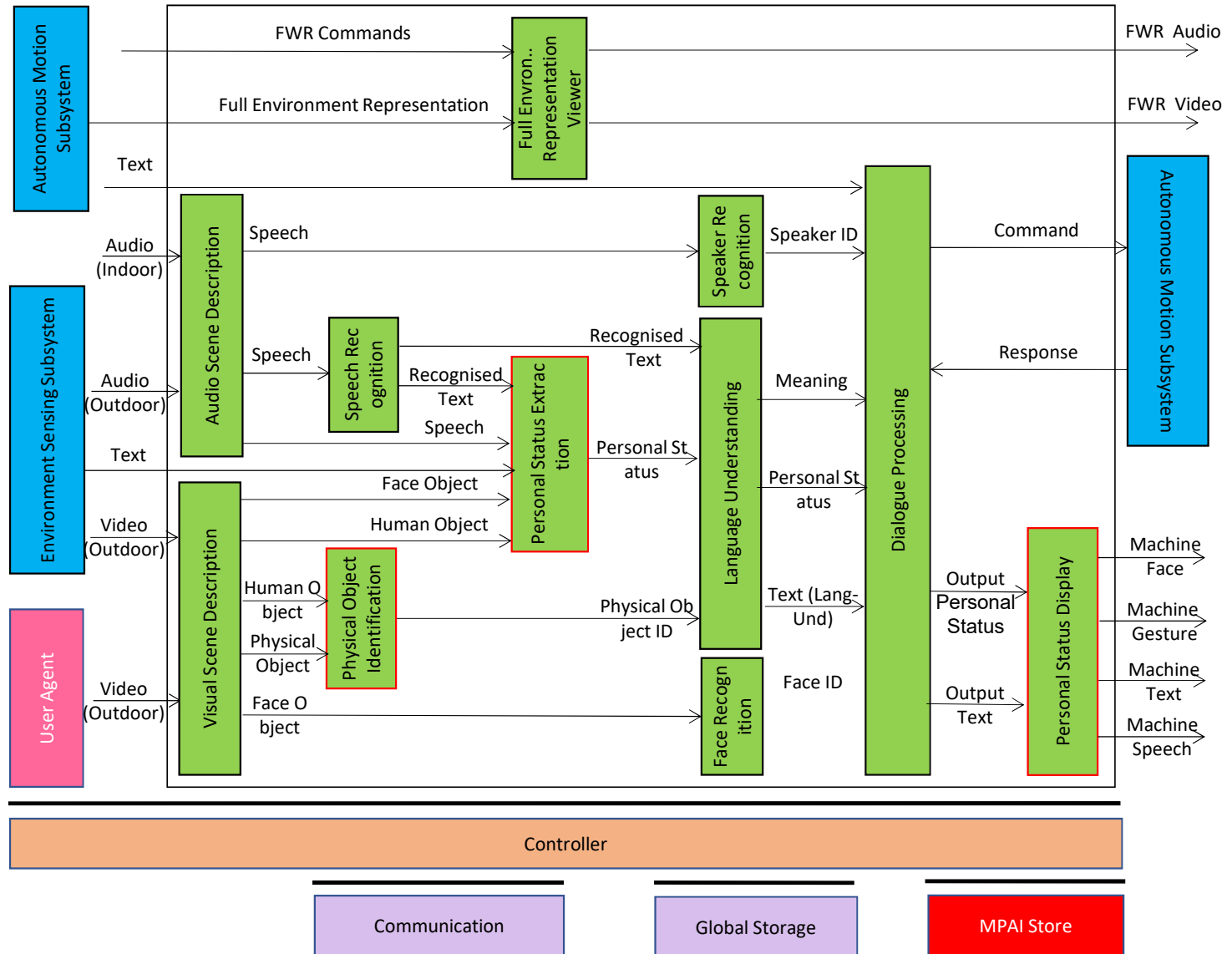
Avatar-based video-conference (ABV)



CAV subsystems

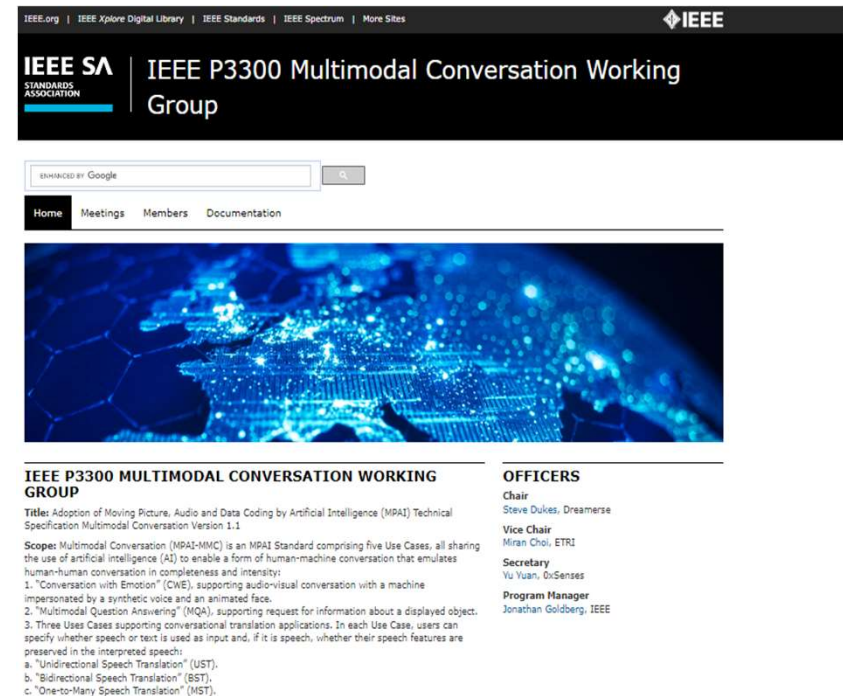


Human CAV Interaction



IEEE SA (표준개발 그룹)과의 협업

- MPAI 표준을 IEEE 표준으로 개발하기 위한 협업
 - **MPAI-MMC** PAR P3300 진행하여 2022.10 최종 승인
<https://sagroups.ieee.org/mmcwg/>
 - MPAI-AIF P3301, MPAI-CAE approved as P3302 PAR
 - IEEE-SA CAG approves P3303 to be submitted to IEEE-SA NesCom for approval (MPAI-CUI)



IEEE.org | IEEE Xplore Digital Library | IEEE Standards | IEEE Spectrum | More Sites

IEEE SA
STANDARDS ASSOCIATION

IEEE P3300 Multimodal Conversation Working Group

ENHANCED BY Google

Home Meetings Members Documentation

IEEE P3300 MULTIMODAL CONVERSATION WORKING GROUP

Title: Adoption of Moving Picture, Audio and Data Coding by Artificial Intelligence (MPAI) Technical Specification Multimodal Conversation Version 1.1

Scope: Multimodal Conversation (MPAI-MMC) is an MPAI Standard comprising five Use Cases, all sharing the use of artificial intelligence (AI) to enable a form of human-machine conversation that emulates human-human conversation in completeness and intensity:

1. "Conversation with Emotion" (CWE), supporting audio-visual conversation with a machine impersonated by a synthetic voice and an animated face.
2. "Multimodal Question Answering" (MQA), supporting request for information about a displayed object.
3. Three Uses Cases supporting conversational translation applications. In each Use Case, users can specify whether speech or text is used as input and, if it is speech, whether their speech features are preserved in the interpreted speech:
 - a. "Unidirectional Speech Translation" (UST).
 - b. "Bidirectional Speech Translation" (BST).
 - c. "One-to-Many Speech Translation" (MST).

OFFICERS

Chair
Steve Dukes, Dreamseer

Vice Chair
Miran Choi, ETRI

Secretary
Yu Yuan, Ousenses

Program Manager
Jonathan Goldberg, IEEE

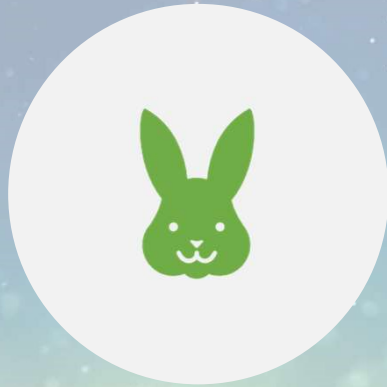


Avatar Representation and Animation (MPAI-ARA)



Importance of Avatar

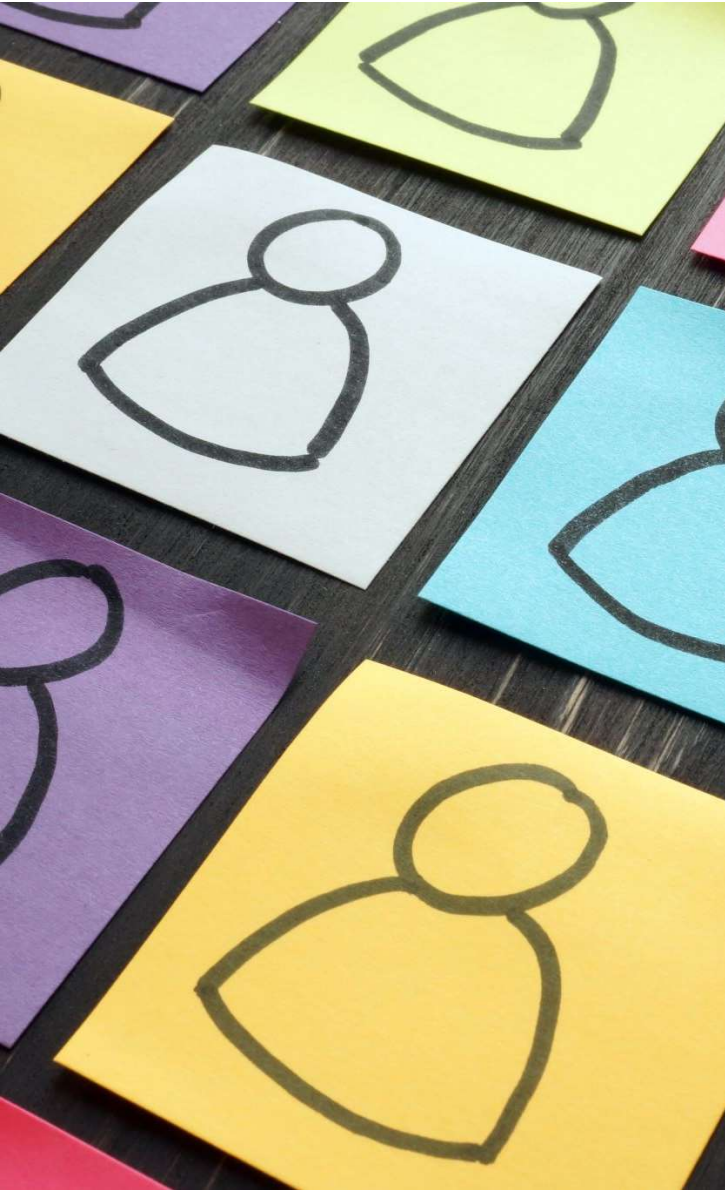
Types of Avatar



AVATARS ARE USED TO EXPRESS MYSELF
IN VIRTUAL SPACES SUCH AS THE
METAVERSE.



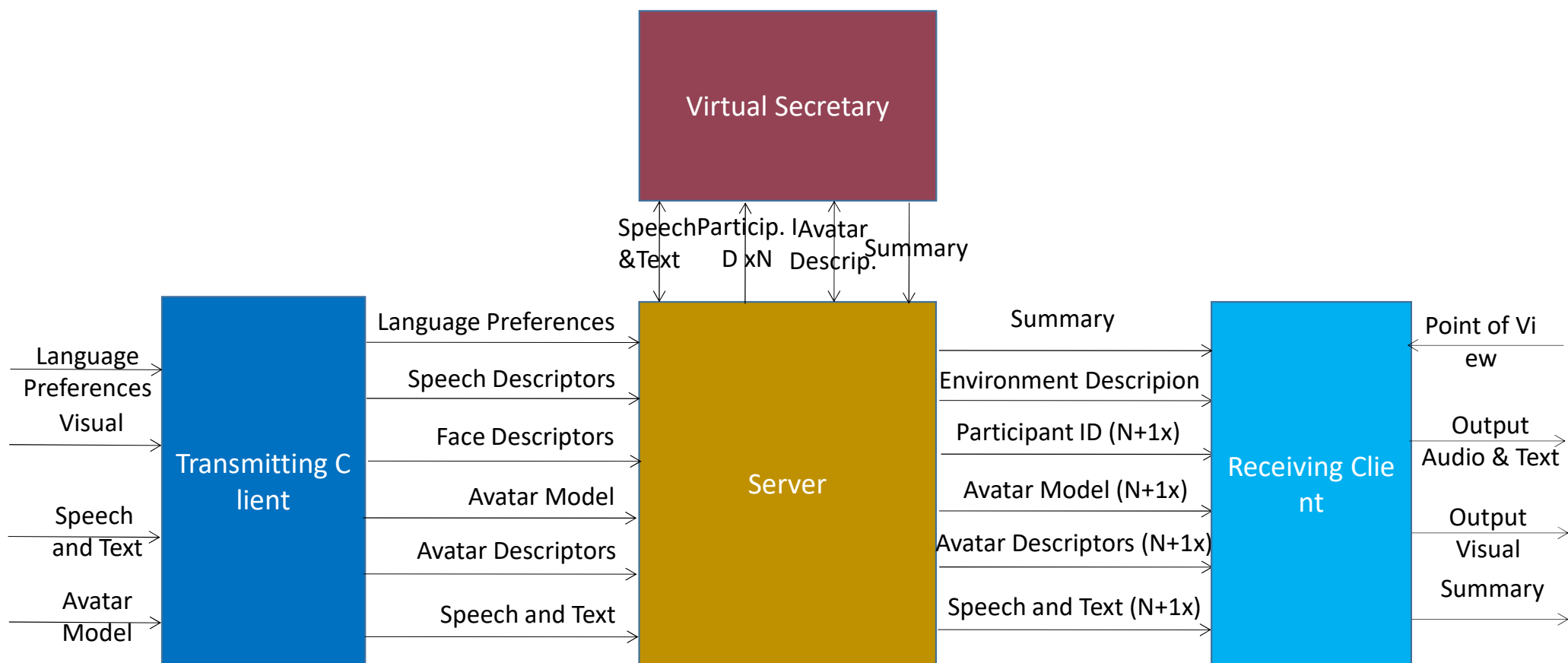
BESIDES ME, IT IS ALSO USED TO EXPRESS
THE EXISTENCE OF SOMEONE OUTSIDE,
SUCH AS A VIRTUAL ASSISTANT.



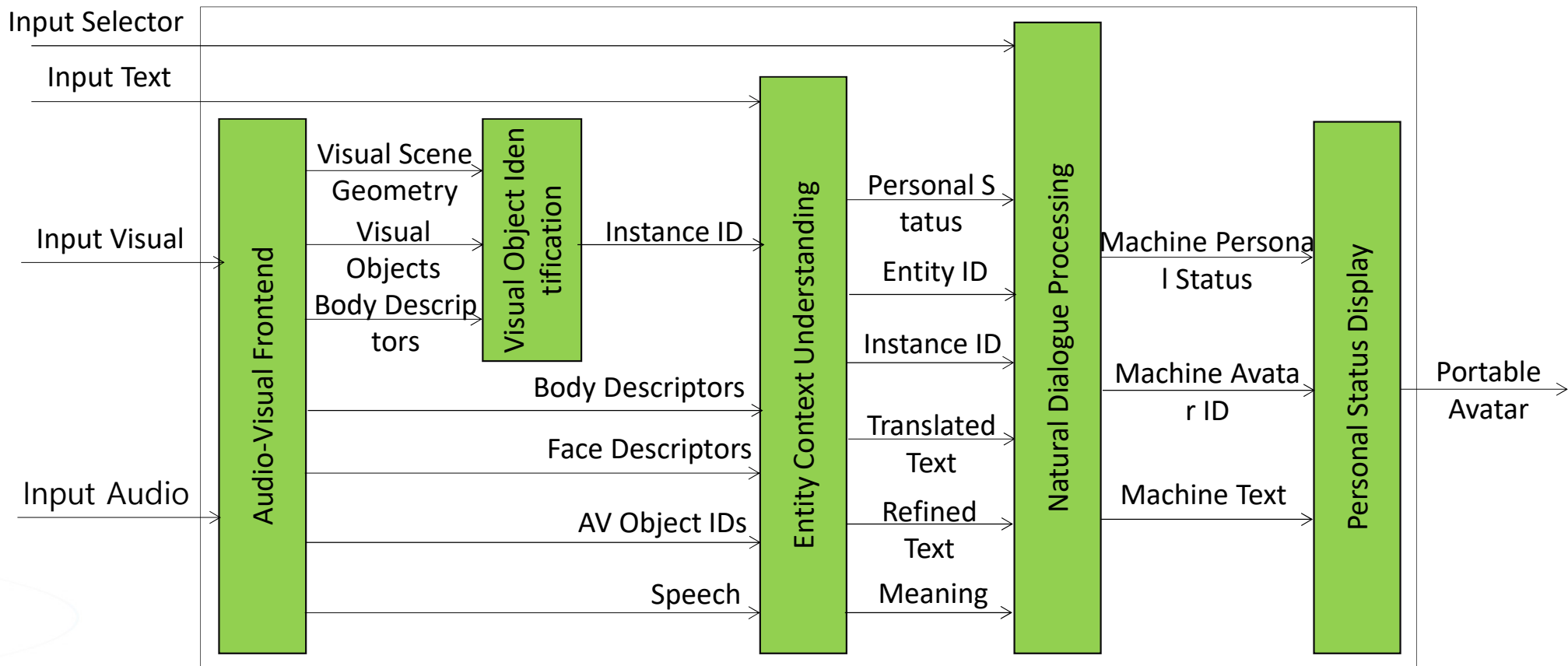
What is Avatar Representation and Animation?

- Objective1: To enable a user to reproduce a virtual environment.
- Objective2: to enable a user to reproduce an avatar of a third party and its animation only using minimal information from that party.
- Objective3: to estimate the personal status of a human of avatar.
- Objective4: to synthesize an avatar displaying a personal status.
- Definition: Personal Status is the ensemble of information internal to a person, including Emotion, Cognitive State, and Attitude.

Target use case: avatar-based video-conference (ABV)



글로벌 ICT 표준 컨퍼런스 2023
Global ICT Standards Conference 2023





감사합니다.

최미란 전문위원, 한국전자통신연구원
miranc@etri.re.kr