Get Your Head Out of the Cloud: Embedded vs. Cloud Based Speech Processing

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Who We Are

- Founded 1995, Private & Profitable
- Headquarters: Ra'anana, Israel
- Focus on embedded speech processing products (ASR, TTS, Biometric Speaker ID, Speech Compression)
- Global customer base in a variety of industries
- Over 40 million products to date
## Language Selection

<table>
<thead>
<tr>
<th>US English</th>
<th>UK English</th>
<th>Brazilian Portuguese</th>
<th>Mandarin Chinese</th>
<th>EU Spanish</th>
<th>Latin Spanish</th>
<th>French</th>
<th>German</th>
<th>Italian</th>
<th>Russian</th>
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The Current Situation

Voice user interfaces (SIRI, Google) have given us unprecedented ease of access to information, BUT:

- Relying on an Internet connection
- Dependent upon cloud-based servers
- Information sourced from various 3rd parties
A Cloudy Experience

- Access depends on coverage
- Latency is an issue
- Overall experience depends on QoS
- Access consumes a lot of power
- Creates privacy concerns
A Cloudy Experience

- Limitations of capacity and bandwidth

- Personalized data security
  - Voice Passwords
  - Voice imprint

- Cannot hear you until you physically “tap it on the shoulder”
A crowded network, long latency and/or poor connection makes your cloud-based VUI as responsive as a stranger in an elevator.
VUI – Just a Gimmick?

- Voice user interface is often viewed as a gimmick
- What happens after it is activated is a mystery
- Perception must change from a gimmick to a reliable functionality
- Embedded VUI will help change perception & meet expectations
VUI Users’ Expectations Rising
To Summarize the Issues

- Latency
- Power Consumption
- Connection (QoS)
- Personalization
- Continuous Listening
- Privacy
Case Study: Cloud Collapses

Amazon’s Elastic Compute Cloud

To see the full video presentation write to fcolletta@rubidium.com
“I say the more we transfer everything onto the web, onto the cloud, the less we’re going to have control over it. ... I really worry about everything going to the cloud.”

Steve Wozniak, Apple Co-Founder
The Embedded Solution

Voice User Interfaces
optimized to work locally
on any platform
(including resource-constrained!)

enabling a predictable, personalized, secure
user experience
Embedded Benefits

- "Voice Trigger" ASR listens continuously
- Virtually no latency time
- Insignificant impact on battery recharge time
- Voice Trigger can be coupled with Biometric ID
- Simplified ASR & TTS functionality when Cloud access/service is not available
The Best of Both Worlds

**Mode 1**
“Inactive”
VAD waits

**Mode 2**
VAD activates
VT which
listens
continuously

**Mode 3**
Full ASR
(local or cloud)
Rubidium’s Voice Trigger

- First Introduced in Nobby
- Runs on a 3 MIPS chip
- “Ancient” Technology from 2001!

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The Bottom Line:
Cloud Based + Local VUI =

- Leveraging each technology’s advantages
- Completely Hands Free VUI
- Always available, personal & secure
- Seamless integration for smooth transition between local and cloud-based service
For more information about our products and services

visit www.rubidium.com