



**A SOFTWARE PLATFORM TO DELIVER  
SMART, USER EMPOWERING ROBOTIC APPLICATIONS**

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# RAPP – Robotic **AP**PLICATIONS

## Manos Tsardoulias

Centre For Research & Technology Hellas (CERTH) / Information Technologies Institute (ITI)

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# The problem

- A **demographic change** affects our society: **elderly** are steadily increasing, caregivers will not be enough.
- The **digital revolution** creates scores of **technologically illiterate people**.
- **Socially interactive robots** can help family and caregivers in assisting elderly and be friendly tutors for technology illiterates.

## RAPP as solution

The RAPP project creates an open-source **software platform** to support the development and distribution of **Robotic Applications (RApps)** which will take into account the special needs of people at risk of exclusion, especially the elderly.

The RAPP platform aspires to:

- Increase the **versatility** and **utility** of robots, while respecting **autonomy** and **privacy** of users.
- Enable and promote the use of small home and service robots as companions to our lives.
- Open and widen a **new ‘inclusion market’ segment** in Europe.

# Robots in RAPP

*NAO humanoid robot*



- Height : 58 cm
- Weight : 4.3 kg
- Autonomy : ~ 60 mins
- 25 DOF
- Linux, Intel Atom @ 1.6 GHz
- C++, Python, Java, Matlab, Urbi, C, .NET
- 2 HD 1280 x 960 cameras
- Ethernet & Wi-Fi



*ANG-light smart rollator*



- 3D accelerometer
- Gyro
- Rear wheels encoders
- Autonomous brake

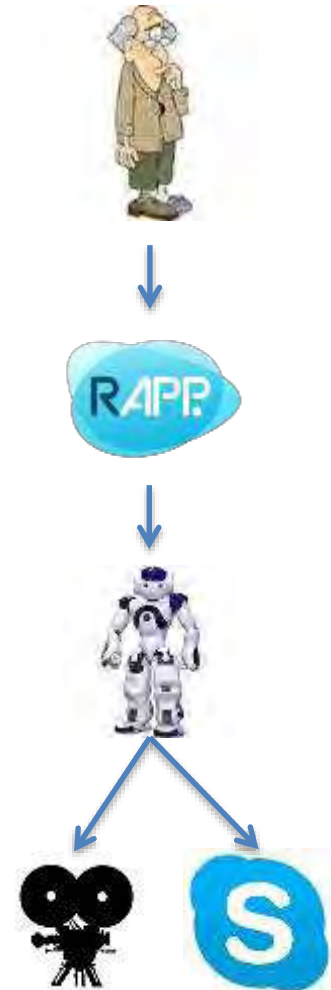
# Pilot for technology illiterate people

Problem:

- A large portion of elderly people have difficulty in using **computers, smart phones** or the **internet**.

Solution: Create RApps to

- Teach the elderly to use electronic devices
- Provide seamless employment of services such as **Skype, e-mail, RSS feeds**
- Use of NAO robot



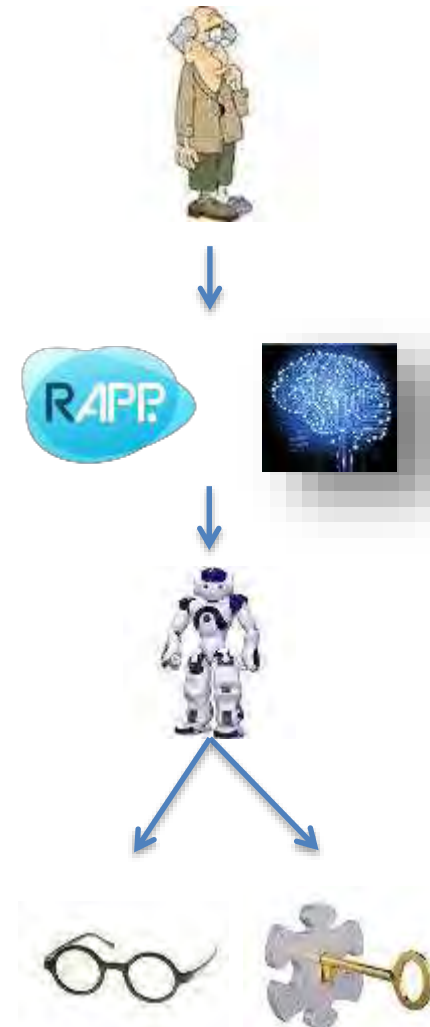
# Pilot for people with mild cognitive impairment

Problem:

- A large portion of elderly people have mild cognitive impairment (memory loss)

Solution: Create a **memory ball**  $\Rightarrow$  RApps to

- Remind important events
- Play **serious games** aiming to train the recollection of memories
- Use of NAO robot



# Pilot for mobility assistance / activity monitoring

Problem:

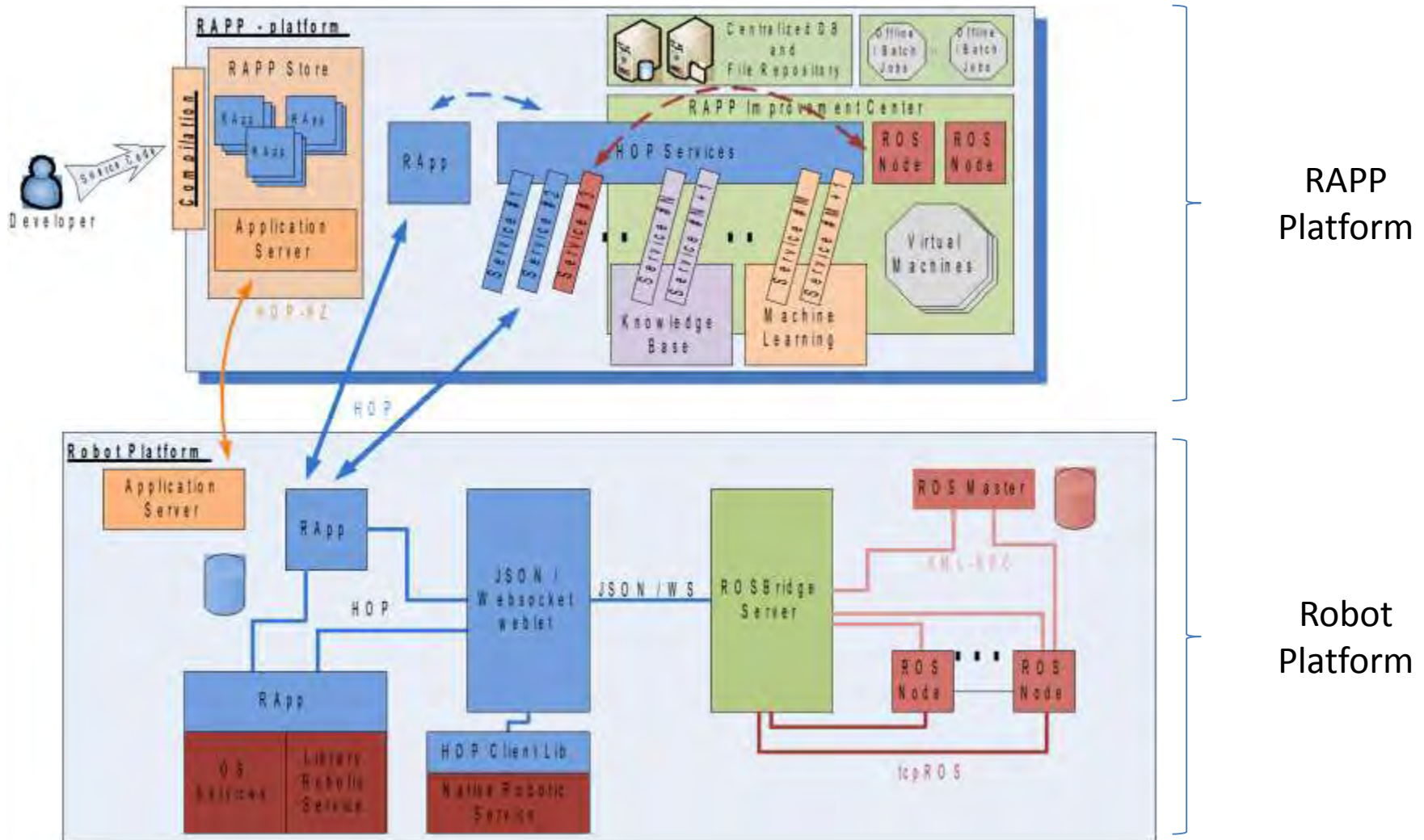
- Elders have **mobility problems**
- Harder to **recover** from accidents (e.g. hip fracture)

Solution: Provide RApps for

- Fall detection / prevention
- Walking analysis
- Use of ANG-light robot

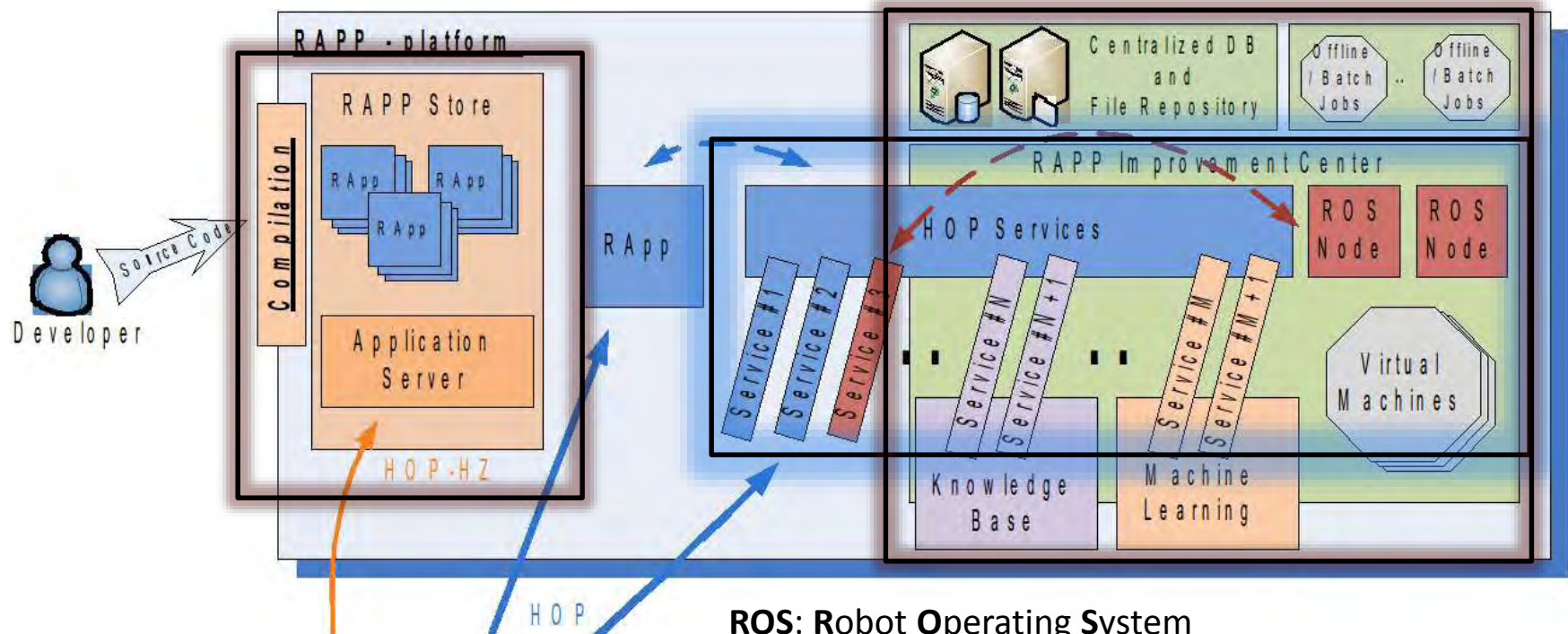


# RAPP Architecture





# RAPP Platform



RAPP Store

ROS & HOP services

RIC (RAPP Improvement Center)

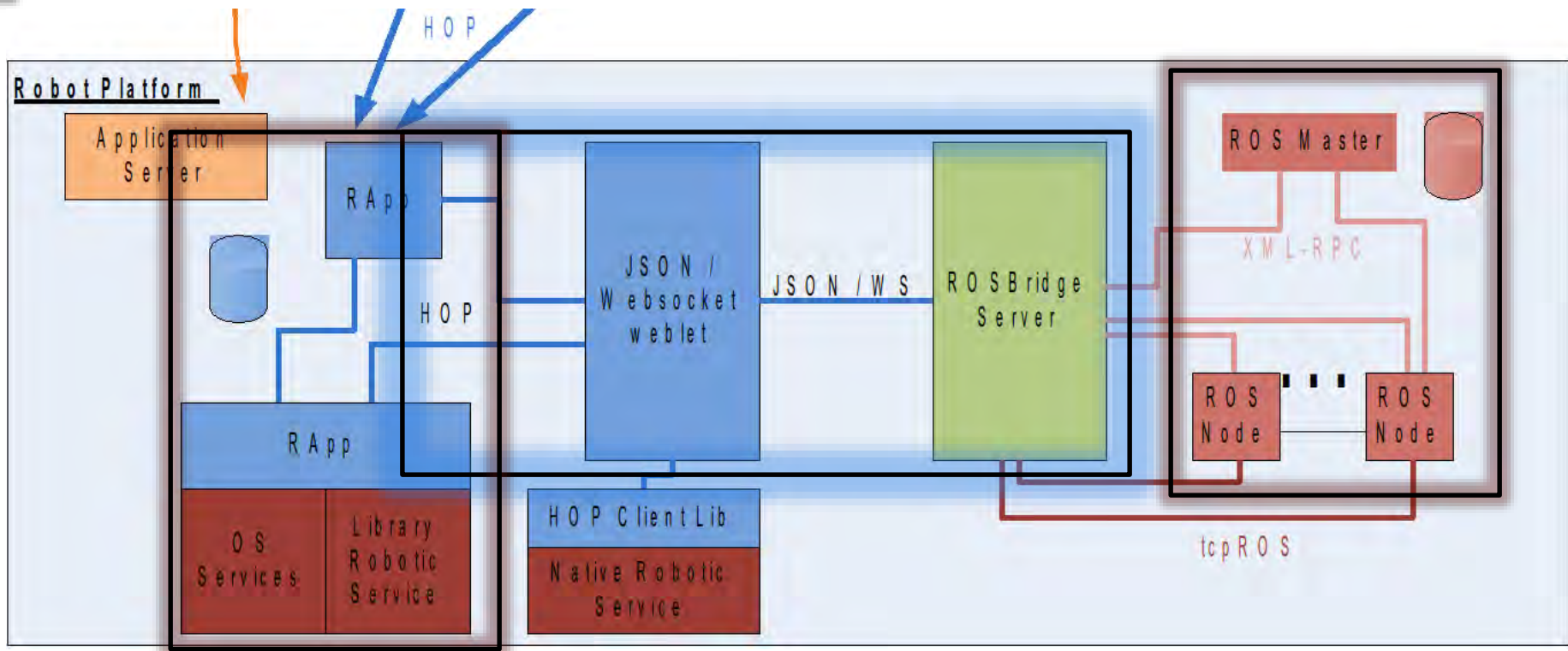
**ROS: Robot Operating System**

- Robotic Framework (Meta-operating system)
- Provides robust infrastructure for development & message passing

**HOP: Multi-tier programming language**

- Designed for programming web applications
- Used for connectivity between robots & RAPP Platform

# Robot Platform(s)



ROS Master  
 ROS & HOP via ROSBridge  
 RApps as FSMs

# RAPP Goals and validation

- Infrastructure for **developers** to **easily** provide **applications**
- Creation of a store – like **Robotic Application Repository**
- Methodology for **knowledge representation** and **sharing**
- Robotic applications **oriented** in the **special needs of elders**
- **Verify** and **validate** the overall approach through **pilots**

# RAPP Partners



# Fact Sheet And Partnership

- Project Acronym: RAPP
- Call Identifier: FP7-ICT-2013-10
- EC Directorate General: DG CONNECT, Unit G4
- Grant Agreement: 610947
- Funding Scheme: Collaborative Project
- Project Duration: 36 months (Dec.2013 - Nov.2016)

## Coordinator

Prof. Pericles A. Mitkas

CERTH

mitkas@iti.gr



# Contact information

*Coordinator*

*Prof. Pericles A. Mitkas*

*CERTH / ITI*

[mitkas@iti.gr](mailto:mitkas@iti.gr) and [mitkas@auth.gr](mailto:mitkas@auth.gr)

The Intelligent Systems and Software Engineering Labgroup  
**(ISSEL)**



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Robotics for social inclusion

**Thank you for your attention!**

[www.rapp-project.eu](http://www.rapp-project.eu)  
[info@rapp-project.eu](mailto:info@rapp-project.eu)



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