

### Project Websites

- University of Rochester, Center for Future Health  
[http://www.futurehealth.rochester.edu/smart\\_home/](http://www.futurehealth.rochester.edu/smart_home/)
- The University of Florida, Gator-Tech Smart House  
<http://www.rerc.ufl.edu/>
- University of Virginia MARC Smarthouse  
<http://smarthouse.med.virginia.edu>
- Georgia Institute of Technology, The Aware Home  
<http://www.cc.gatech.edu/fce/ahri/>
- Massachusetts Institute of Technology, House n  
[http://architecture.mit.edu/house\\_n/](http://architecture.mit.edu/house_n/)

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### Center for Future Health

- University of Rochester
- Pre-concept testing, concept testing, pilots, and prototype testing
- Using infrared sensors, computers, biosensors, and video cameras in 5 rooms
- Measurement of traditional vital signs (blood pressure, pulse, respiration)
- Measurement of "new vital signs", such as gait, behavior patterns, sleep patterns, general exercise, rehabilitation exercises, and more

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### Gator-Tech Smart House

- The University of Florida
- Focus is on older people with disabilities
- Developing communications, home monitoring, and "smart" technology for older persons
- Sensors embedded in the wall and floor
- Smart phone that will allow residents to give commands to the house
- RFIDs in food packaging
- Computers with video teleconferencing capability

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### House\_n

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- Massachusetts Institute of Technology
- The Changing Places/House\_n Consortium has designed a unique “living laboratory” called the PlaceLab
- Develop innovative user interface applications that help people easily control their environment, save resources, remain mentally and physically active, and stay healthy

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### House\_n Projects

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- Sensor network
- Environmental sensing
- State sensors
- Location beacons
- Audio sensing
- Wearable biometric and motion sensors.
- Addressable lighting
- Environmental control
- Still image and video capture
- Context-aware experience sampling
- Activity recognition algorithms
- Image-based experience sampling
- Audio communication

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### MavHome (Managing an Adaptive Versatile Home)

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The screenshot shows a home automation interface with a house icon on the left. The main area contains several panels: 'Automated blinds' with a window icon, 'Remote site Assistance for disabilities' with a wheelchair icon, and a 'Lighting Status and Control' section with icons for 'HOME', 'Light', 'HVAC', 'Lock', 'Security', 'Phone', 'Mixer', and 'Speech'. At the bottom, there is a status bar with the following information: 'REFRESH LivingRoom DN OFF 10%Clap Last Refresh: 10-10-2002 - 15:07:15'. Below this, there are two columns of room status indicators: 'Living Room: OFF', 'Living Room: OFF', 'Master Bedroom East: ON', 'Master Bedroom West: ON', 'Carpenter Room: ON' in the first column; and 'Diner: ON', 'Front Room: OFF' in the second column.

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### MavHome: Bob Scenario

- 6:45 am: MavHome turns up heat to achieve optimal temperature for waking (**learned**)
- 7:00 am: Alarm rings, lights on in bed-room, coffee maker in the kitchen (**prediction**)
- Bob steps into bathroom, turns on light: MavHome records this interaction (**learning**), displays morning news on bathroom video screen, and turns on shower (**proactive**)
- While Bob shaves, MavHome senses he is 2 lbs overweight, adjusts his menu (**reasoning and decision making**)
- When Bob finishes grooming, bathroom light turns off, kitchen light and menu/schedule display turns on, news program moves to the kitchen screen (**follow-me multimedia communication**)
- At breakfast, Bob notices the floor is dirty, requests janitor robot to clean house (**reinforcement learning**)
- Bob leaves for office, MavHome secures the house and operates lawn sprinklers despite knowing 70% predicted chance of rain (**over rule**)
- In the afternoon, MavHome places grocery order (**automation**)
- When Bob returns, grocery order has arrived and hot tub is ready (**just-in-time**).

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### Microsoft Home

- First built 1994, this is a concept facility that models technology that might enhance life at home 5 to 10 years from now.
- Microsoft Home simulates a domestic environment including a front door, entry/foyer, kitchen, family room, dining room, entertainment room and bedroom.
- Uses "smart personal object technology," or SPOT
- Ubiquitous connectivity is attained by means of both wired and wireless technology. The key enabler is the IP-based network that uses Web services protocols developed by Microsoft over the years which link all of the electronic devices in the home.
- The home, utilizing hardware from companies like Compaq, Cisco and Rio, is networked with home networking features native to the Microsoft Windows operating system

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### Adaptive Home, University of Colorado

- Not a programmable house, but a house that programs itself.
- **House adapts to the lifestyle of the inhabitants.**
  - House monitors environmental state and senses actions of inhabitant.
  - House learns inhabitants' schedules, preferences, and occupancy patterns.
  - House uses this information to achieve two objectives:
    - anticipate inhabitant needs
    - conserve energy
- Uses ACHE (Adaptive Control of Home Environment) that provides a separate control system for each of the following:
  - air heating
  - lighting
  - water heating
  - ventilation

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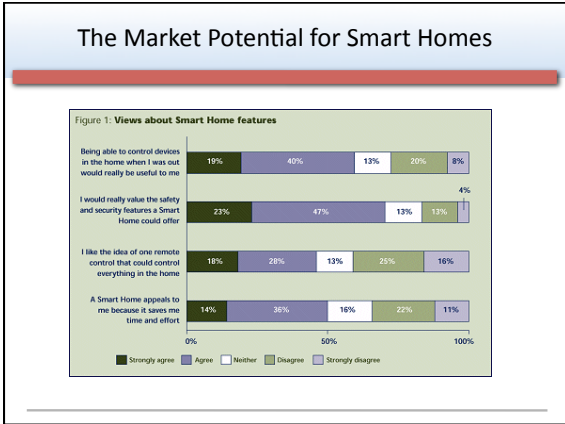
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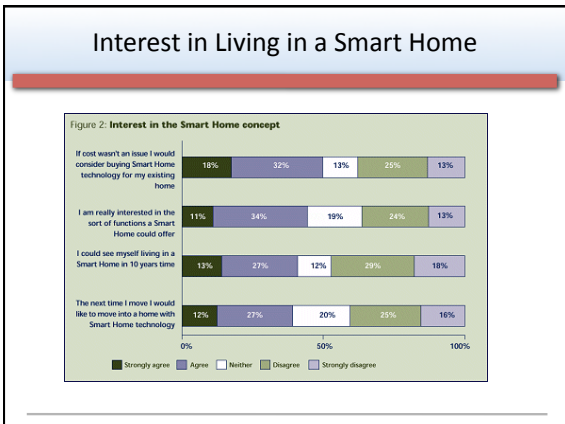
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### Results

**The interested:**  
 people aged 15-34  
 family households  
 those with pay TV and home entertainment systems (i.e. DVDs and video games consoles), internet access  
 those on higher incomes  
 those who hold positive attitudes about new technology

**The ambivalent:**  
 well-represented across all groups in the population, though marginally more likely to be older and on medium/low incomes.

**The uninterested:**  
 aged 55 and over  
 households without children  
 households without PCs, Pay TV or home entertainment systems

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