

User-Centered Smart Homes

The success of smart-home technology—much of it driven by optics and photonics—will depend on users making it part of their everyday routines. A 2020 study in *Frontiers in Psychology* considered user-centered scenarios for smart-home solutions—focusing on different needs for different stages of life.



Retirees 60s–70s



Midlife 40s–50s



Singles 30s

ISSUES

- Health problems
- Mobility difficulties
- Low physical activity
- Social isolation
- Fear of new technology

- Decrease in strength/tires easily
- Little time to care for health
- Lack of rest from continuous work
- Lack of regular exercise/activity
- Lack of family/personal time

- Feeling lonely/stressed
- Eating/sleeping irregularities
- Home care neglect
- Lack of community connection
- Lack of exercise and hobbies

NEEDS

- Therapy and telemedicine
- Automation of daily routines
- Assist activities
- Family interaction
- Simple to use technology

- Health care management
- Physiological monitoring
- Virtual exercise
- Remote business systems
- Family schedule sharing

- Assess sleep/health patterns
- Remote monitor/control of environment/appliances
- Social network of similar ages in complex

SMART SOLUTION: A centralized system that assures privacy and automatically supports users without need to directly manipulate devices.

FOCUS

- Sensors provide reminders for medicine and monitor for crisis situations
- Helper robots perform household tasks

- Sensors monitor health/stress levels and provide guidance
- Family room equipped with family-friendly AI educational and exercise programs

- Sensors monitor and provide reminders for sleep/eating
- Offsite control for appliances, plant care and pet feeding
- VR-connected exercise program