All Sciences Proceedings
http://as–proceeding.com/

1st International Conference on Scientific and Innovative Studies
April 18–20, 2023 : Konya, Turkey

ICSIS
https://as–proceeding.com/index.php/icsis

The Effect of Smart Home Technology on the Quality of Life of the Elderly

Ferit SEVEN[1*], Mahmut DİRİK[2]

[1]*Graduate School of Energy Science and Technologies, Sirnak University, 73000, Sirnak, Türkiye*
[2]*Department of Computer Engineering, Sirnak University, Şirnak, 73000, Türkiye*

[*]*(feritsvn@gmail.com) Corresponding author*

Abstract – Integration of smart home technology has emerged as a critical development that significantly increases the wellbeing of elderly people. This is accomplished by providing various tools and services that support health, safety and independent living conditions. The use of advanced security features such as remote monitoring, security cameras and motion sensors has been effective in preventing accidents and alerting caregivers or family members in potential emergencies, thus increasing the feeling of independence and self-sufficiency among the elderly. It also allows elderly people to maintain their independent living for long periods of time. In particular, smart home devices that allow an individual to control their environment through voice commands or remote access are optimized for efficiently and effectively completing daily activities. This technology also provides many health and fitness benefits, particularly for elderly people who are socially isolated or living alone. Studies have shown that smart home technology has a significant potential to improve the quality of life of elderly people. In conclusion, it is considered a critical development that allows elderly people to live independently, comfortably and safely.

Keywords –Smart Home Technology, The Quality Of The Elderly, Elderly Individuals And Independence Living, Social Isolation, Life Quality

1. Introduction

Smart home technology has revolutionized the way elderly individuals live by providing them with a safer and secure living environment. Various tools and services have been developed to support health, safety and independent living conditions with the advancements in information and communication technologies [1]. Smart homes offer advanced safety and security features such as remote monitoring to help prevent accidents and alert caregivers or family members in the event of an emergency, along with security cameras and motion sensors [2]. This technology provides peace of mind to both the elderly and their families, enabling them to live more comfortably and securely. Smart home technology also increases the independence and autonomy of the elderly, allowing

them to live more independently for longer periods of time. This technology can help individuals more efficiently and effectively perform their daily tasks, with voice commands or remote access to control their environments [3]. With the use of smart home devices, elderly individuals can adjust lighting, temperature and other settings in their homes without the help of a caregiver or family member [4]. This independence and autonomy can significantly improve the quality of life of elderly individuals, allowing them to maintain their dignity and control over their lives [5]. Smart home technology also offers a variety of health and wellness benefits for the elderly. Wearable devices, smart home gyms and health applications can enable elderly individuals to easily track their health and fitness and receive personalized care [6]. Additionally, integrated telehealth devices can help individuals manage their health conditions and receive medical care in the comfort of their homes [7]. This technology has been particularly beneficial for isolated or lonely elderly individuals as it provides access to medical care and support [8]. Overall, smart home technology has the potential to significantly enhance the quality of life of elderly individuals and enables them to live more independently, securely and comfortably [9]–[11]

2. Smart Home Technology

Smart home technology, also known as home automation systems, is used to control lighting, heating, security, and other home appliances [12]. These systems use built-in smart home technology to allow you to manage the system from home or remotely through devices such as a smartphone or tablet [13]. With the advancement of technology, smart home features are gaining new capabilities every day [14]. Smart home technology has been designed in recent years with technological innovations to help reduce the lives of the elderly. These technologies enable the elderly to feel more independent and secure in their homes. Smart home technology allows elderly people to communicate with various devices in their homes, and among these technologies for improving the quality of life at home are smart devices, home automation systems, security cameras, fire alarm systems and other various devices [15]. Systems for running a smart home operation to ensure independent living for the elderly include staying at home longer, securing their safety, providing faster emergency storage, preserving their health status and keeping automatic records of care and assistance [16]. However, there are some drawbacks to the use of smart home technology. These technologies may be difficult to use for some elderly people, while also having high costs that can be a barrier. Smart home technology is a system used to make your home more comfortable, secure, and energy efficient. It includes the following features:

- **Home automation:** Smart home technology is a system that automates your home. This system can automatically manage functions like temperature control, lighting, curtain opening/closing, and many more in your home [17].

Figure 1 Smart Home [18]

- **Security:** Smart home technology can also be used for the security of your home. This system can control the security of doors, windows, and other entry points and can manage the alarm systems in the home [19].

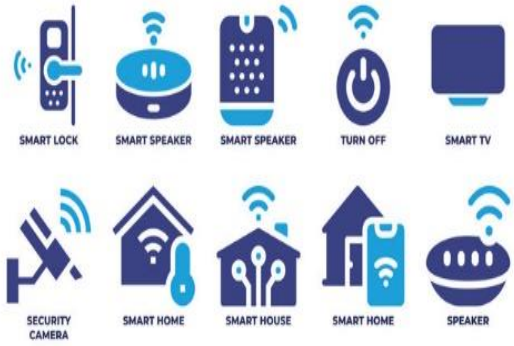

Figure 2 Security [20]

- **Energy Efficiency:** Smart home technology can be used to make your home more energy efficient. This system can optimize the energy usage of lighting, heating and cooling systems in the home [20].

Figure 3 Energy Efficiency [22]

- **Voice control:** Smart home technology can enable you to control devices in your home with voice commands. This system can control functions such as turning lights on/off, playing music and even turning the oven on/off [21].

Figure 4 Voice Control [24]

- **Remote Access:** Smart home technology is a system that allows you to control your home remotely. This system enables you to control devices in the home through mobile devices or computers and also allows you to monitor security cameras in your home [21].

Figure 5 Remote Access [25]

3. Smart Home Technologies for the Needs of the Elderly

Smart home technologies present numerous advantages for the elderly population. By incorporating voice command capabilities and user-friendly interfaces, these systems can simplify daily routines, leading to a substantial improvement in overall quality of life. Furthermore, seniors and individuals with disabilities can readily access and benefit from smart home technologies [26]. Additionally, the integration of smart home devices in enhancing home security plays a crucial role in ensuring the safety and well-being of elderly individuals within their residences. It may be beneficial in the following areas:

- **Security:** Smart home technology can be used to increase safety for seniors in the home[27]. For example, you can watch events inside and outside the house with security cameras in the house. In addition, alarm systems and locking mechanisms in the home can also be controlled intelligently.
- **Health:** Smart home technology can be beneficial for the health of the elderly [28]. For example, smart sensors can be used to monitor the movements and activities of the elderly and this data can be shared with a healthcare professional or caregiver.
- **Communication:** Smart home technology can help elderly people stay connected with their families and friends [28]. With features such as voice and video calls, seniors can easily stay in touch with those they love.
- **Eases:** Smart home technology can be used to improve the quality of life for the elderly in their homes [29]. For example, smart lighting and curtain systems allow the elderly to easily control the lighting and curtain opening/closing processes.
- **Energy Efficiency:** Smart home technology can help seniors increase energy efficiency in their homes [29]. For example, smart thermostats can help optimize heating and cooling systems in seniors' homes, resulting in energy savings.
- **Independence:** Smart home technology can increase the independence of seniors [30]. For example, with the help of smart home technology, seniors can manage tasks around their homes more easily and require less assistance.
- **Decreasing Loneliness:** Smart home technology can help reduce loneliness among seniors [29]. For example, smart speakers can help meet the needs of seniors in the home, such as listening to music or conversing.

4. Increasing Quality of Life for the Elderly Through Smart Home Technologies

Smart home technology represents a valuable resource in enhancing the quality of life for the elderly population. By facilitating greater independence and security within their homes, smart home technology can contribute significantly to seniors' well-being. For instance, the remote control of various home elements, such as lighting, temperature, and door access, empowers seniors to maintain their autonomy [31]. Furthermore, smart home technology can assist in promoting adherence to medication regimens. A range of smart home devices and equipment have been specifically developed to support seniors in leading more fulfilling, self-sufficient lives within their domestic environments. Below are some of the smart home devices and equipment that could be beneficial for seniors:

- **Smart thermostats:** These devices are used to control the temperature and humidity in the home [27]. They help seniors adjust the temperature and humidity in their home to suit them and to lead a more comfortable life.
- **Smart lighting systems:** These systems help seniors to control the lighting in their home [27]. Seniors can use their smart phones or voice commands to turn on and off lights in their home or adjust brightness levels.
- **Smart security cameras:** These cameras help to keep seniors' homes safe. Seniors can view the camera from anywhere in their home via a smart phone or tablet [27].
- **Smart doorbells:** These devices help elderly people recognize visitors coming to their homes and open the door safely [21]. The elderly can control the doorbells from their smart phones or tablets.
- **Smart robotic vacuums:** These devices help the elderly to clean their homes. The elderly can control robot vacuums via their smartphones or tablets [21].
- **Smart health devices:** These devices help elderly people track their health status [28]. For example, smart bracelets can help the elderly track their pulse, blood pressure, and sleep quality.
- **Smart sound systems:** These systems help the elderly to participate in music listening and other activities at home. The elderly can play music through their smartphones or tablets, or they can easily plan other activities [27].

Smart home devices and equipment designed to suit the needs of the elderly can help them to live more comfortably, safely, and independently at home.

4.1. Smart Home Technology Reducing Care Costs for The Elderly

smart home technology holds the potential to substantially decrease the cost of care for the elderly population. By enabling seniors to remotely manage various aspects of their homes, such as lighting, temperature control, and door access, smart home technology promotes greater autonomy and

independence [33]. Moreover, the technology assists seniors in adhering to medication regimens, which is critical for their health and well-being [34]. It is evident that smart home technology can play a pivotal role in alleviating care costs for the elderly. Below are some examples of how smart home technology can help reduce the cost of care for the elderly [35]:

- **Home Care:** Smart home technology can help reduce the cost of home care for seniors. Smart sensors can track activities in the home to help seniors live safely, which reduces care costs.
- **Medical care:** Smart home technology can help reduce medical care costs for seniors. For example, with the help of smart devices and mobile applications, seniors can take their medication regularly and monitor their health status. This reduces medical care costs.
- **Emergency Situations:** Smart home technology can help reduce emergency care costs for the elderly. For example, with the help of smart sensors and alarm systems, falls and other emergencies in the home of the elderly can be quickly detected. This reduces emergency care costs.
- **Caregivers:** Smart home technology can reduce the costs of caregivers for the elderly. For example, with the help of smart sensors, the elderly can live more independently at home and the number of caregivers can be reduced. This reduces the costs of caregivers.

In conclusion, smart home technology can help to reduce the cost of care for the elderly. However, the costs of smart home technology should also be considered. Smart home technology can reduce care costs in the long run but may require a high initial investment.

4.2. Smart Home Technology increasing independence and freedom for the elderly

Smart home technology can help to increase the independence and freedom of the elderly. Below are some examples of the effects of smart home technology on the independence and freedom of the elderly [36]:

- **Stay at Home:** Smart home technology can increase the independence and freedoms of seniors by enabling them to stay at home. Smart sensors and devices can help seniors stay safe at home and make it easier for them to get the help they need.
- **Less Need for Care:** Smart home technology can help seniors increase their independence by requiring less care. For example, with smart home technology, seniors can handle tasks around the house more easily and require less help.
- **Communication:** Smart home technology can increase freedoms by meeting the communication needs of seniors. With features like voice and video calling, seniors

can easily keep in touch with their loved ones.

- **Interaction:** Smart home technology can increase freedoms by meeting the interaction needs of seniors. For example, with smart speakers, seniors can listen to music or participate in other activities.
- **Freedom to Oneself:** Smart home technology can increase the independence of seniors by giving them freedom to themselves. For example, with smart home technology, seniors can adjust lighting or temperature in the house as they wish.

In conclusion, smart home technology can help increase the independence and freedom of seniors. However, smart home technology alone is not enough for seniors to receive the care and support they need. Creating a care plan tailored to the needs of seniors can help increase their independence and freedom when combined with smart home technology.

4.3.Smart Home Technologies for the Elderly, Accessibility and Usability

Smart home technologies addressing the challenges of accessibility and usability in smart home technologies for seniors is of paramount importance [37]. Given that elderly individuals often have limited access to and experience with technology, coupled with age-related changes in physical and mental abilities, it is essential that smart home technologies be designed with their specific needs in mind [38]. Several recommendations can be made to enhance the accessibility and usability of these technologies for seniors:

- **Simple Interfaces:** Devices should incorporate straightforward, easy-to-understand interfaces with features such as large buttons, clear symbols, and intuitive navigation [39].
- **Voice Control:** Equipping devices with voice control functionality allows for hands-free operation, providing greater ease and convenience for seniors [40].
- **Remote Control:** Incorporating remote control features enables elderly users to manage their devices through smartphones or tablets, offering additional flexibility and control [40].
- **Color Contrast:** Considering visual impairments common among seniors, devices should feature suitable color contrasts to improve visibility and ease of use [41].
- **Auditory Feedback:** Providing auditory feedback while using devices can help seniors operate them correctly and enhance overall user experience [40].
- **Education and Training:** Offering education and training on the use of smart home technologies empowers seniors to comfortably and confidently use these

devices, thereby promoting independence [42].

By prioritizing accessibility and usability in the design of smart home technologies, the elderly population can benefit from increased comfort, security, and autonomy in their homes.

5. Smart Home Technology Security and Privacy

Smart home technology has the potential to enhance the comfort, security, and autonomy of our domestic environments, yet it simultaneously introduces challenges pertaining to security and privacy [43]. The interconnectivity of these devices makes them more susceptible to cyberattacks, necessitating the implementation of robust software and security protocols [42]. Regular updates to these devices are crucial to maintain optimal security.

Moreover, privacy concerns arise from the data collected and stored by smart home devices, which monitor users' activities and habits within their homes. Inadequately protected data may be exploited by malicious actors. Consequently, manufacturers and users must prioritize the security and privacy of these devices. Adherence to standard security protocols and the provision of user controls to safeguard device data are essential [43].

Furthermore, users should take measures to enhance security and privacy, such as employing strong, unique passwords, updating devices consistently, and securing their home networks. Ultimately, a collaborative effort between manufacturers, users, and regulatory bodies is necessary to strike a balance between the benefits of smart home technology and the imperative of safeguarding security and privacy.

6. CONCLUSION

In conclusion, the integration of smart home technology presents a valuable opportunity to enhance the quality of life for the elderly population. By fostering greater independence and augmenting safety measures, such innovations can contribute significantly to the well-being of seniors. Furthermore, these devices provide valuable data for healthcare professionals, enabling them to make more informed decisions regarding the health of their patients. In cases of emergencies, smart home technology also facilitates a swift response through automated assistance requests. Nevertheless, it is imperative to ensure that seniors are well-informed about the proper utilization of these technologies and remain vigilant with respect to privacy and security concerns. As such, while smart home technology holds substantial promise in elevating the living conditions for seniors, its deployment necessitates careful consideration and appropriate safeguards.

REFERENCES

[1] E. TEZEL, “YAŞLILARIN AKILLI EV TEKNOLOJİLERİYLE İLGİLİ TUTUMLARI: DESTEK TEKNOLOJİLERİYLE İLGİLİ BULGULAR VE ÖNERİLER,” *Journal of Engineering Sciences and Design*, vol. 3, no. 3, pp. 285–292, 2015.

[2] F. İLKBAHAR, Ş. ÜNAL, A. T. KARAKAYA, and B. EREN, “Akıllı Ev Sistemleri Üzerine Bir Model Önerisi,” *AJIT-e Online Academic Journal of Information Technology*, vol. 12, no. 45, pp. 90–105, May 2021, doi: 10.5824/ajite.2021.02.005.x.

[3] P. Yurdanur Dülgeroğlu YÜKSEL, "İSTANBUL TEKNİK ÜNİVERSİTESİ FEN BİLİMLERİ ENSTİTÜSÜ YAŞAM DÖNGÜSÜNE BAĞLI OLARAK KONUT TASARIMINI ETKİLEYEN FAKTÖRLER YÜKSEK LİSANS TEZİ Rabia ALGA Anabilim Dalı: Mimarlık Programı: Mimari Tasarım," 2005.

[4] "Akıllı Ev Sistemleri | Akıllı Ev Ürünleri ve Fiyatları - Witteh." https://witteh.com/urun-kategori/akilli-ev-sistemleri/ (accessed Apr. 17, 2023).

[5] E. TEZEL, "YAŞLILARIN AKILLI EV TEKNOLOJİLERİYLE İLGİLİ TUTUMLARI: DESTEK TEKNOLOJİLERİYLE İLGİLİ BULGULAR VE ÖNERİLER," *Mühendislik Bilimleri ve Tasarım Dergisi*, vol. 3, no. 3. Süleyman Demirel Üniversitesi, pp. 285–292, Dec. 24, 2015. Accessed: Apr. 17, 2023. [Online]. Available: https://dergipark.org.tr/tr/pub/jesd/issue/20874/224039

[6] L. ATEŞOĞLU, "YAŞAM KALİTESİNE GERONTEKNOLOJİK BAKIŞ," *The Journal of Academic Social Science Studies*, vol. 10, no. Number: 63, pp. 471–486, Jan. 2017, doi: 10.9761/jasss7365.

[7] "Akıllı Ev: Geleneksel Sağlık Hizmetlerinin Yerini mi Alıyor?" https://www.saglik.org.tr/post/akilli-ev-geleneksel-saglik-hizmetlerinin-yerini-mi-aliyor (accessed Apr. 17, 2023).

[8] "Yaşlı Bakımı için IoT'yi seçin - www.mokotechnology.com." https://www.mokosmart.com/tr/choose-iot-for-elderly-care/ (accessed Apr. 17, 2023).

[9] "Akıllı Evler Hayatı Nasıl İyileştirir? – DijiTekno." https://dijitekno.com.tr/?p=9108 (accessed Apr. 17, 2023).

[10] D. Erkan Çer Öğr Üyesi Nazan Kahraman Timur Yılmaz, *Editörler*. [Online]. Available: www.kibatek.com.tr

[11] "Sağlıkta Nesnelerin İnterneti - MOKOSmart #1 Çin'de Akıllı Cihaz Çözümü." https://www.mokosmart.com/tr/iot-in-healthcare/ (accessed Apr. 17, 2023).

[12] İ. AVCI, "Akıllı Evlerde IoT Teknolojileri ve Siber Güvenlik," *European Journal of Science and Technology*, Mar. 2022, doi: 10.31590/ejosat.1080228.

[13] "Akıllı Evler ve Akıllı Ev Sistemleri Nedir, Nasıl Çalışır." https://www.sektorumdergisi.com/akilli-ev-nedir-akilli-ev-sistemleri-nelerdir/ (accessed Apr. 17, 2023).

[14] "Akıllı Ev Nedir? - Realty Group." https://www.realtygroup.property/tr/what-is-a-smart-home (accessed Apr. 17, 2023).

[15] "Akilli ev sistemleri." https://alarmsistemleri.org/akilli-ev-sistemleri (accessed Apr. 17, 2023).

[16] "Yaşlılar, Hastalar ve Engelliler için Akıllı Ev Sistemleri - kbox Solutions Blog." https://kboxsolutions.com/tr/blog/yaslilar-hastalar-ve-engelliler-icin-akilli-ev-sistemleri/ (accessed Apr. 17, 2023).

[17] "Akıllı Ev Sistemleri Nedir? Enerji Verimliliğine Katkıları Nelerdir? Legrand Akıllı Ev Uygulamaları ve Çözümleri." https://www.elektrikport.com/teknik-kutuphane/akilli-ev-sistemleri-nedir-enerji-verimliligine-katkilari-nelerdir-akilli-ev-uygulamalari-ve-cozumleri/24054#ad-image-0 (accessed Apr. 17, 2023).

[18] "Akıllı Ev Sistemleri Bina Otomasyonu - INTERPOINT Teknoloji." https://e-akilliev.com/akilli-ev-sistemleri-bina-otomasyonu/ (accessed Apr. 19, 2023).

[19] "Akıllı Ev Otomasyon Sistemleri ve Kullanım Alanları." https://www.elektrikrehberiniz.com/otomasyon/akilli-ev-otomasyon-sistemleri-9926/ (accessed Apr. 17, 2023).

[20] "Imágenes de 'Smart Tv Icon': descubre bancos de fotos, ilustraciones, vectores y vídeos de 38 | Adobe Stock." https://stock.adobe.com/ar/search?k=%22smart%20tv%20icon%22 (accessed Apr. 19, 2023).

[21] "Akıllı Ev Sistemleri | Akıllı Bina Otomasyonu." https://www.makel.com.tr/tr/akilli-ev/akilli-ev-sistemleri (accessed Apr. 17, 2023).

[22] "DANFOSS ALLY™ AKILLI EV ISITMA KONTROL ÜRÜNLERİ - Haliç Mekanik." https://www.halicmekanik.com.tr/danfoss-ally-akilli-ev-isitma-kontrol-urunleri (accessed Apr. 19, 2023).

[23] "Akıllı Ev | Audio Elektronik A.Ş. | Görüntülü Diafon, Akıllı Ev Sistemleri." https://www.audio.com.tr/akilli-ev/ (accessed Apr. 17, 2023).

[24] "Akıllı Ev Sistemleri | My World Akıllı Ev Sistemleri." https://myworldteknoloji.com/akilli-ev-sistemleri/ (accessed Apr. 18, 2023).

[25] "Akıllı Ev Sistemleri Nedir? Kendi Akıllı Ev Otomasyonunu Kur." https://evdekorasyon.xyz/akilli-ev-sistemleri-nedir/ (accessed Apr. 19, 2023).

[26] "Yaşlılar için en iyi ev güvenliği | Yale." https://www.yalehome.com/tr/tr/stories/news/yaslilar-icin-en-iyi-ev-guvenligi (accessed Apr. 17, 2023).

[27] "Yaşlılar İçin Hayat Kurtaran Akıllı Ev Sistemleri - Pratik Grup." https://pratikgrup.com/yaslilar-icin-hayat-kurtaran-akilli-ev-sistemleri/ (accessed Apr. 17, 2023).

[28] Y. Prof. Dr. Yahşi YAZICIOĞLU Ünite, P. Tevfik Volkan YÜZER Ünite, and E. ProfDr Gülsün KURUBACAK, "EV TEKNOLOJİSİ."

[29] "Yakın gelecekte görebileceğimiz 7 akıllı ev teknolojisi | Hepsiemlak | Emlak Yaşam." https://www.hepsiemlak.com/emlak-yasam/haberler/projeler-haberler/ipuclari/yakin-gelecekte-gorebilecegimiz-7-akilli-ev-teknolojisi (accessed Apr. 17, 2023).

[30] K. GÖKÇAKAN, "YAŞLILARIN MEKÂNA DAİR SORUNLARI VE AKILLI EV TEKNOLOJİLERİ İLE OLAN İLİŞKİLERİ," 2019.

[31] "Yaşlılar İçin Hayat Kurtaran Akıllı Ev Sistemleri - Pratik Grup." https://pratikgrup.com/yaslilar-icin-hayat-kurtaran-akilli-ev-sistemleri/ (accessed Apr. 17, 2023).

[32] Ş. Demirci, "SAĞLIĞIN DİJİTALLEŞMESİ DIGITALIZATION OF HEALTH", doi: 10.20875/makusobed.383071.

[33] E.TEZEL, "YAŞLILARIN AKILLI EV TEKNOLOJİLERİYLE İLGİLİ TUTUMLARI: DESTEK TEKNOLOJİLERİYLE İLGİLİ BULGULAR VE ÖNERİLER," *Journal of Engineering Sciences and Design*, vol. 3, no. 3, pp. 285–292, 2015.

[34] "Yaşlılar için en iyi ev güvenliği | Yale." https://www.yalehome.com/tr/tr/stories/news/yaslilar-icin-en-iyi-ev-guvenligi (accessed Apr. 17, 2023).

[35] K. GÖKÇAKAN, "YAŞLILARIN MEKÂNA DAİR SORUNLARI VE AKILLI EV TEKNOLOJİLERİ İLE OLAN İLİŞKİLERİ," 2019.

[36] "Yaşlılar İçin En İyi Akıllı Ev Cihazları - Affde Marketing." https://www.affde.com/tr/best-smart-home-devices-for-the-elderly.html (accessed Apr. 17, 2023).

[37] A. G. Özgür, Ç. Baş, A. Kocatepe, Ü. Bilgi, and İ. Daire Başkanlığı, "ERİŞİLEBİLİRLİK VE KULLANILABİLİRLİK KAMU İNTERNET SİTELERİ REHBERİ (KAMİS)".

[38] U. İnsan, Ç. Dergisi, and S. Çataloğlu, "International Journal of Human Studies Old Age, Value and Technology Yaşlılık, Değer ve Teknoloji", doi: 10.35235/uicd.434005.

[39] E. Selcan Baranseli and Ö. Ö. Şafak, "60 Yaş Üstü Bireylerin Mobil Uygulama Kullanım Alışkanlıklarının İncelenmesi Investigation of Mobile Application Use Habits of Individuals over 60 Years Old".

[40] "Akıllı Ev | Audio Elektronik A.Ş. | Görüntülü Diafon, Akıllı Ev Sistemleri." https://www.audio.com.tr/akilli-ev/ (accessed Apr. 17, 2023).

[41] V. KALINKARA "Yaşlılarda Renk Algısı Ve Yaşam Ortamlarında Renk Kullanımı". Sinop Üniversitesi 8.Uluslararası Meslek Yüksekokulları Sempozyumu, UMYOS'19 cilt no.1 sayfa no. 642-648

[42] E.TEZEL, "YAŞLILARIN AKILLI EV TEKNOLOJİLERİYLE İLGİLİ TUTUMLARI: DESTEK TEKNOLOJİLERİYLE İLGİLİ BULGULAR VE ÖNERİLER," *Journal of Engineering Sciences and Design*, vol. 3, no. 3, pp. 285–292, 2015.

[43] Ö. Üyesi and Ö. Aydin, *BİLGİSAYAR SİSTEMLERİNDE GÜVENLİK VE GİZLİLİK EDİTÖR*. [Online]. Available: www.efeakademi.com

[44] M. O. KANDIR, E. YOLAÇAN, and Ş. IŞIK, "Security Of the Internet of Things: Home Network Security Review and Evaluation," *Uludağ University Journal of The Faculty of Engineering*, pp. 803–816, Aug. 2022, doi: 10.17482/uumfd.1068960.

[45] M. Zekeriya GÜNDÜZ, R. Daş, B. Üniversitesi, T. Bilimler MYO, and B. Teknolojileri Bölümü, "Akıllı Şebekeler: Siber Güvenlik Unsurları ile Veri İletimi," *Derleme Makalesi*, no. 2, pp. 1–10, 2021.