

FIQH ROBOTIC FOR ARTIFICIAL INTELLIGENT IN HUMANOIDS USED FOR THERAPY, SERVICES AND OTHER SOCIAL ACTIVITIES: AN INTEGRATION OF ARTIFICIAL INTELLIGENCE (AI) AND MAQASID SHARIAH

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Abstract

Humanoid is part of the Social Assistive Robotics (SAR) which has been designed with a comprehensive artificial intelligence system that is widely used for elderly care, rehabilitation for people with physical disabilities as well as the intervention of individuals with cognitive impairment. Nowadays, with the advance of this technology, the world is also utilizing these humanoids for social activities and services. Consequently, some controversial questions amongst religious scholars, academicians, clinicians, services and societies arise on the urgency to use humanoid robots for therapy of the intervention in the brain-impairments, elderly care, rendering general services or for social companions when the world seems to adapt that humanoid is one of those modes, which shows potential in giving better outcomes. Due to the problem, there is an urgency to develop Fiqh Robotics to help the nation at large on the permissible of using humanoids used for social activities, services and rehabilitation. A qualitative method is used in analysing and synthesizing the relevant literature and document review to develop this Fiqh Robotic from the framework of Maqasid Shariah, together with the combination of accelerating rapid growth of the world Artificial Intelligence (AI), particularly discussing the measurement Humanoid Robot Interaction (HRI), Maqasid Shariah Principles, Islamic Legal Maxims and the permission of using this approach in Islam.

Keywords: Artificial Intelligence, Fiqh Robotic, Humanoids, Maqasid Shariah.

1. INTRODUCTION

The commonly known Artificial Intelligence (AI) is a subset of Artificial General Intelligence (AGI). As a matter of fact, the current AI is known as a “narrow AI”, a specific program that can solve problems in a specialized area (Pennachin & Goertzel, 2007). However, most of these narrow AIs require input that fit their requirements before they can begin solving problems. AI is responsible for the development of programs that demonstrate intelligence in specific functions such as medical diagnosis and autopilot in cars. One alternative description of AGI is the humanized robotic androids that we commonly see in science fictions. As of this writing, a fully functioning AGI is yet to be developed. However, the research on developing and improving computer intelligence is rapidly performed and this contributes to AGI realization (Basheer & Hajmeer, 2000; Russell, Dewey & Tegmark, 2016).

Siau and Wang (2020) deals with the ethical implications and moral questions that arise from the development and implementation of artificial intelligence (AI) technologies. It also reviews the guidelines and frameworks that countries and regions around the world have created to address them. It compares the current main frameworks with the main ethical issues, highlighting gaps in mechanisms for fair benefit sharing, responsibility assignment, worker exploitation, energy demands in the context of environmental and climate change, and more complex and less certain AI implications, such as those involving human relationships.

On the other hand, Socially Assistive Robotics (SAR) is a field in HRI that focuses on assisting people through social interaction rather than physical interaction (Feil Seifer & Mataric, 2005). Service and assistive robotics include a broad spectrum of application areas such as office assistants, autonomous rehabilitation aids and educational robots. A study done by Torta et al. (2014) on a short-term and a long-term evaluation of a small socially assistive humanoid robot in a smart home environment. Eight elderly people tested an integrated smart-home robot system in five real-world scenarios. Six of the participants experienced the system in two sessions over a two-week period; the other two participants had a prolonged experience of eight sessions over a three-month period. Results showed that the small humanoid robot was trusted by the participants. A cross-cultural comparison showed that results were not due to the cultural background of the participants. The long-term evaluation showed that the participants might engage in an emotional relationship with the robot, but that perceived enjoyment might decrease over time. However, the interaction between humans and AI robots may have

exceeded the companionship level. One elderly couple even stated that the companion robot named AIBO is one of their family members. Although AIBO was developed over a decade ago and its production discontinued, AIBO robots are still being maintained by a cadre of retired AIBO engineers (Kovac & Jousan, 2016).

Socially assistive robotics can be used as a functional tool for aiding in the completion of physical tasks or as a therapeutic tool in the imitation of physical tasks. KineTron (Kozyavkin & Ablikova, 2014), Ursus (Mejías et al., 2013) and Cosmobot (Brisben, Safos, Vice & Lathan, 2014) are robots that were used as tools in motor training activity. All three robots were used to act as a coach for encouraging participants in motor training and increasing the interest of children in therapy. The KineTron robot used in the study by Kozyavkin and Ablikova (2014), indicated that all six children with CP were motivated and participated actively in the physical exercises. Mejías et.al. (2013) used a robot toy called 'Ursus' in their study to conduct upper limb physical therapy. Their results showed that all six children (a combination of children with CP and brachial plexus injury) enjoyed the session with the robotic platform when compared to conventional therapy.

2. FIQH ROBOTIC FOR ARTIFICIAL INTELLIGENT IN HUMANOIDS

The analytical view of Islamic Jurisprudence on the use of humanoids for brain impairment and other social activities is now referring in this paper as Fiqh Robotic. Over the past few years, artificial intelligence (AI) has taken over society through various inventions of technologies. Humanoids are built with special characters to perform tasks that humans can do. They are now available for the use of rehabilitation for the intervention of individuals with cognitive impairment as well as for social activities. These humanoids are considered as blessings to humankind while raising complex ethical issues regarding human dignity and religiosity debate. This paper provides insights on the use of humanoids for augmenting therapy and other social activities particularly discussing the Fiqh of Islamic Jurisprudence and the permissibility of using this approach in Islam from the aspect of objectives of shariah, Islamic principles of treatment, Islamic legal maxims and level of necessity concerned.

Positive argument has been advanced in favour of robot development in terms of numerous benefits of robot helping human being in carrying out various tasks especially dirty and dangerous assignments. Substantial success has been

recorded in favour of this argument, now robot has been employed in car-production plants capable of huge range of delicate and accurate actions, in the painting, welding and assembly of cars, unmanned aerial vehicles for deadly and dangerous missions, robotic police and military (robocop/roboarmy) for various security and combat missions, domestic robot for household jobs (Sandia Report, (2008). Amongst the robots and its role in elderly healthcare is Companionable that can support cognitive stimulation and therapy management of the care-recipients in a smart home environment. The GiraffPlus (a telepresence robot) allows relatives or caregivers to virtually visit the elderly person at home and can monitor the activities in the home environment. The Accompany robot, on the other hand, can provide physical, cognitive and social assistance in daily home task by assisting user to carry out certain tasks on his/her own (Portugal et.al., 2018).

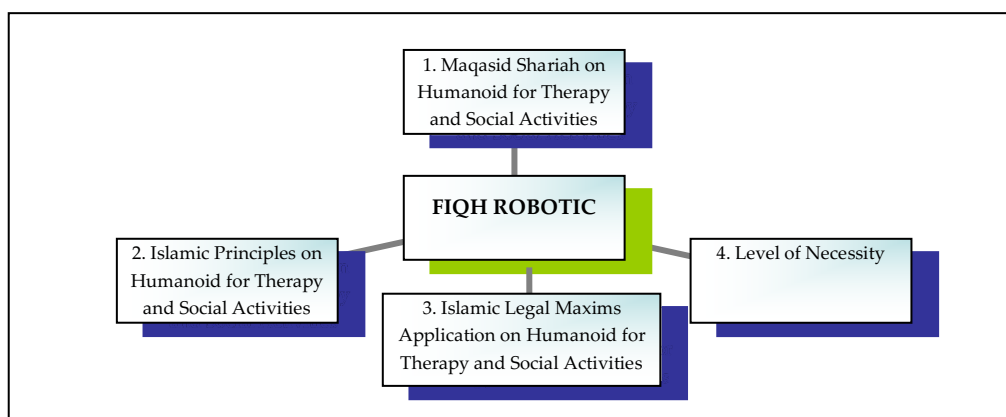


Figure 1. Fiqh Robotic for Artificial Intelligent in Humanoids Used for Therapy, Services and Other Social Activities: An Integration of Artificial Intelligence (AI) And Maqasid Shariah

2.1 *Maqasid Shariah*

Maqasid Shariah or known as the Objectives of Shariah enables a better appreciation of Islam as well as a comprehensive appreciation of the Almighty rules and regulation (Abdullah, 2012), which consist of the preservation of religion, life, progeny, intellect and wealth. As a result, Shariah and its Objectives accept treating a patient with medication and therapy (Fatahiyah & Hanapiah, 2017).

2.2 *Islamic Principles on Humanoid for Therapy and Social Activities*

To preserve the five basic intents, it should be done in following the Islamic Principles. The statement of “The Ends Justify The Means” is not been

practiced in Muslim Community. In Islamic perspective, we should use the correct way to achieve the correct objectives or achievements by adhering to the Islamic Principles. In the medical and health care aspect, there are seven major principles to be followed: In line with the teachings of Islam; The treatment should be based on the Islamic Legal Maxims; Focus on the prevention and cure (al-wiqayah); Avoid doing destructions (sad al-zarai'); Believe in the power of Allah to cure every illness; Using unlimited method of treatment which in line with Islamic Principles; Following the Islamic Legal Maxims on Healthcare.

2.3 Islamic Legal Maxims Application

Islamic legal maxims are general rules of Fiqh. The actual wordings of these maxims are taken from the al-Quran and Sunnah. Islamic scholars compiled and developed it into a simple format which can be applied to various cases that come under the common rulings (Mohamad Akram, 2006). These principles are usually used by many Islamic scholars who treat them as a branch of the Shariah objectives (Mohammad Hashim, 2009). Islamic Legal Maxims are the guided rules and regulations to be fulfilled to measure the significant of implementing some actions. The rules are: Matters shall be judged by their objectives; Certainty shall not be removed by doubt; Hardship shall bring alleviation (al- Masyaqqah tajlibu Al-Taisir); Harm shall be removed; Cultural usage shall have the weight of law.

2.4 Level of Necessity

With the changing nature of human civilization and needs, Islam accommodated the incorporation of permanent features to adapt these changes. Maslahah, considering its benefits, is aimed to shape human needs, hence is such a tool which allows creativity, dynamism and flexibility in terms of social policies (Al-Mubarak & Osmani, 2010). The levels of Maslahah consists of (1) Urgency (ad-dharuriyyat): guaranteeing their 'vital needs, (2) Necessity (al-hajiyat): catering for their requirements, (3) Additional Facilities or luxuries (at-tahsiniyyat): allowing for 'betterment', enhancement or improvement (tahsiiniyaat) in the quality of life.

3. METHODOLOGY

This paper focuses on qualitative research methods based on content analyses. The early stage of this study focuses on library search, case studies and document reviews that relate to humanoids for therapy and community

services. The inclusion criteria for selection were studies that used social robots for therapy and social activities. Details focal points leading to the Islamic concept of using the humanoids at large. The final stage is the implementation of Design and Development Research (DDR) where discussions with the State Fatwa Council had been done and the international fatwa has been referred.

4. RESULT AND DISCUSSION

To evaluate the permissibility of using humanoids for intervention of individuals with cognitive impairment and social activities, we should examine thoroughly the four main elements which consist of Maqasid Shariah, Islamic Principles on humanoid for therapy and social activities, Islamic Legal Maxims Application and the Level of Necessity. Objectives of Syariah explains the wisdoms behind rulings, such as 'enhancing social cohesion, which is one of the wisdoms behind charity, being good to one's neighbors' and greeting people with peace. Wisdoms behind rulings also include developing consciousness of God, which is one of the rationales behind regular prayers, fasting, and supplications (Auda, 2008).

The wisdom behind using humanoids for therapy is to heal the individual with cognitive impairment to protect and preserve the five basic intents. While using the humanoid for social activities is allowed if it does not endanger the person and does not take control over his or her mind from the ultimate power of God to heal or to give better life, not the humanoids.

Siau and Wang (2020) mapped the main ethical dilemmas and moral questions associated with the deployment of AI. The report begins by outlining several potential benefits that could arise from AI as a context in which to situate ethical, social and legal considerations. Within the context of issues for society, the report considers the potential impacts of AI on the labor market, focusing on the likely impact on economic growth and productivity, the impact on the workforce, potential impacts on different demographics, including a worsening of the digital divide, and the consequences of deployment of AI on the workplace. The report considers the potential impact of AI on inequality and how the benefits of AI could be shared within society, as well as issues concerning the concentration of AI technology within large internet companies and political stability. Other societal issues addressed in this chapter include privacy, human rights and dignity, bias, and issues for democracy.

AI ethics is also reflected within the framework of metaethics, in which questions about the effectiveness of normative demands are investigated. Ethical discourses can either be held with proximity to their designated object,

or it can be the opposite. The advantage of a proximity is that those ethical discourses can have a concrete impact on the course of action in a particular organization dealing with AI. The downside is that this kind of ethical reflection must be quite narrow and pragmatic. Uttering more radical demands only makes sense when ethical discourses have a certain distance to their designated object. Nevertheless, those ethical discourses are typically rather inefficient and have hardly any effect in practice. (Daly et al.,2019).

In searching for the articulation of Objectives of Shari'ah, Bedoui (2012) provides a broader and more effective articulation of Objectives of Shariah concept according to Abdel Majid Najjar within 4 objectives and 8 corollaries as depicted in Table 1.

Table 1: Najjar's Concept of Objectives of Shariah (Bedoui, 2012)

i. Safeguarding the value of human life	(a) Faith (b) Human rights
ii. Safeguarding the human self	(a) Self (b) Intellect
iii. Safeguarding the society	(a) Posterity (b) Social entity
iv. Safeguarding the physical environment	(a) Wealth (b) Environment (Ecology)

Another implication of accepting robot as human-like is the possibility of “companion robots”. Tanaka et al. (2015) found that companion robots exist in current generation and it has taken the form of animals (AIBO) and recently a children-like form; Pepper the robot, Sophia, Lynx and SAM. Although current companion robots have limited communication capability, but as discussed before in the previous section, humans have regarded these robots as “living family member” (Kovac & Jousan 2016). On the other hand, Al-Asfahani emphasized that the development or improvement of the earth for the better living of all is one of the responsibilities of man towards the Creator, Allah. He refers to the Islamic approach to development as proficient and holistic where faith and action, spirit and matter, education and health, peace and security, economics and political power elements are interlinked (Oladapo & Ab Rahman, 2017).

However, despite the interrelated role of the factors in enhancing human development, very few studies have investigated this from an Islamic perspective. By using the above guidelines and discussions, establishment of a ruling with a supporting argument against another argument in the presence

of acceptable excuse: (what is allowed to be done or not to be done) due to the acceptable excuse with the presence of the reasons in order to making it or leaving it.

5. CONCLUSION

The preceding discussions highlight the significance of Fiqh Robotics and analyze the systematic rulings that must be followed to regulate the usage of humanoids in order to maximize the positive influence of technology while avoiding harm to society and the world at large. Humanoids should not be used to completely replace humans; instead, they should be acknowledged as human-like, and humanoids should not be created to look exactly like humans in terms of life-form. The person in charge of the humanoids should follow the Fiqh Robotics elements and the code of ethics. We hope that by implementing this Fiqh Robotics, we will be able to ensure that everyone has the opportunity to live in a peaceful and healthy environment, avoiding the social damage and crime that can follow.

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7. REFERENCES

- Abdullah, S. (2012). Risk Management Via Takaful from A Perspective of Objectives of of Shariah. *Procedia-Social and Behavioral Sciences*, 65, 535-541.
- Auda, J. (2008). *Objectives of al-Shariah: An introductory guide*. Herndon: International Institute of Islamic Thought (IIIT).
- Agrigoroaie, R., & Tapus, A. (2017). Contactless Physiological Data Analysis for User Quality of Life Improving by Using a Humanoid Social Robot. In: *International Conference on Image Analysis and Processing*, pp. 696-706 Springer, Cham.
- Al-Mubarak, T., & Osmani, N. M. (2010). Applications of Objectives of al-Shari'ah and Maslahah in Islamic Banking practices: An analysis. In *International Seminar on Islamic Finance in India*, pp. 4-6.
- Basheer, I. A., & Hajmeer, M. (2000). Artificial neural networks: fundamentals, computing, design, and application. *Journal of Microbiological Methods*. 43 (1): 3-31. doi: [http://dx.doi.org/10.1016/S0167-7012\(00\)00201-3](http://dx.doi.org/10.1016/S0167-7012(00)00201-3).
- Bedoui, M. Housseem Eddine. (2012). *Ethical Competitive Advantage for Islamic Finance Institutions: How should They Measure Their Performance?* Harvard University.
- Beasley, R. A. (2012). *Medical Robots: Current Systems and Research Directions*. In: *Journal of Robotics*, 1-14 doi:10.1155/2012/401613.
- Brisben, A., Safos, C., Lockerd, A., Vice, J., & Lathan, C. (2005). The Cosmobot System: Evaluating Its Usability in Therapy Sessions with Children Diagnosed with Cerebral Palsy. Retrieved on, 3(25), 13.
- Caic, M., Mahr, D. & Oderkerken-Schröder, G. (2018). Value of Social Robots in Services: Social Cognition Perspective. *Journal Of Services Marketing*, 33, 463-478.
- Choudhury, A., Li, H., Greene, C. M. & Perumalla, S. (2018). Humanoid Robot-Application and Influence. *Archives Of Clinical and Biomedical Research*, 2, 197-226.

- Chung, M. J., Park, H. K., Hong, H. S., & Kwon, H. J. (2002). A Nursing Robot System for the Elderly and the Disabled. In: International Workshop on Human-friendly Welfare Robotic Systems, pp. 122-126.
- Dahlan, H. A. (2018). Future Interaction between Man and Robots from Islamic Perspective.
- Daly, A., Hagendorff, T., Li, H., Mann, M., Marda, V., Wagner, B., ... & Witteborn, S. (2019). Artificial intelligence, governance and ethics: global perspectives. *The Chinese university of Hong Kong faculty of law research paper*.
- D'onofrio, G., Fiorini, L., Hoshino, H., Matsumori, A., Okabe, Y., Tsukamoto, M., Limosani, R., Vitanza, A., Greco, F., Greco, A., Giuliani, F., Cavallo, F. & Sancarlo, D. (2018). Assistive robots for socialization in elderly people: results pertaining to the needs of the users. *Aging Clinical and Experimental Research*.
- Fatahiyah, M. S., & Hanapiah, F. A. (2017). Merging the Research on Halal Concept Using Humanoids for Patient with Brain-Impairment: Its Maqasid and Principles. *Pertanika Journal of Social Sciences & Humanities*, 25.
- Franceschini, N., Ruffier, F., & Serres, J. (2007). A Bio-Inspired Flying Robot Sheds Light on Insect Piloting Abilities. *Current Biology*, 17(4), 329-335.
- Garcia, F., Pandey, A. K. & Fattal, C. (2019). Wait for me! Towards socially assistive walk companions.
- Kovac, I., & Jousan, J. (2016). *Man's Best Friend*. NHK Inside Lens. Japan: NHK World.
- Kovac, M., Fuchs, M., Guignard, A., Zufferey, J. & Floreano, D. (2008). A Miniature 7g Jumping Robot," in *IEEE International Conference on Robotics and Automation*, pp. 373–378.
- Kozyavkin, V., Kachmar, O., & Ablikova, I. (2014). Humanoid Social Robots in The Rehabilitation of Children with Cerebral Palsy. In: *Proceedings of the 8th International Conference on Pervasive Computing Technologies for Healthcare* (pp. 430-431). Institute for Computer Sciences, Social-Informatics and Telecommunications Engineering ICST.

- Kurzweil, R. (2014). The Singularity is Near. In R. L. Sandler (Ed.), *Ethics and Emerging Technologies*, pp. 393-406, London: Palgrave Macmillan.
- Lo, A. C., Guarino, P. D., Richards, L. G., Haselkorn, J. K., Wittenberg, G. F., Federman, D. G., ... & Bever Jr, C. T. (2010). Robot-Assisted Therapy for Long-Term Upper-Limb Impairment After Stroke. *New England Journal of Medicine*, 362(19), 1772-1783.
- Feil-Seifer, D., & Mataric, M. J. (2005). Defining Socially Assistive Robotics. In: 9th International Conference on Rehabilitation Robotics, 2005. ICORR 2005, pp. 465-468 IEEE.
- Mejías, C. S., Echevarría, C., Nuñez, P., Manso, L., Bustos, P., Leal, S., & Parra, C. (2013). Ursus: A robotic assistant for training of children with motor impairments. In *Converging Clinical and Engineering Research on Neurorehabilitation*, pp. 249-253. Springer, Berlin, Heidelberg.
- Mohamad Akram Laldin. (2006). *Islamic Law: An Introduction*. International Islamic University Malaysia.
- Mohammad Hashim Kamali. (2009). *Qawa'id al-fiqh: The legal maxims of Islamic Law*. The Association of Muslim Lawyers http://www.sunnah.org/fiqh/usul/Kamali_Qawaid_al-Fiqh.pdf. (17.6.09)
- Niiyama, R., Nagakubo, N. & Kuniyoshi, Y. (2007). Mowgli: A Bipedal Jumping and Landing Robot with An Artificial Musculoskeletal System, In: *IEEE International Conference on Robotics and Automation*, pp. 2546–2551
- Oladapo, I. A., & Ab Rahman, A. (2017). Objectives of Sharī 'Ah: The Drive for An Inclusive Human Development Policy. *Jurnal Syariah*, 24(2)
- Oña, E. D., Cano-de la Cuerda, R., Sánchez-Herrera, P., Balaguer, C., & Jardón, A. (2018). A review of robotics in neurorehabilitation: Towards an automated process for upper limb. *Journal of Healthcare Engineering* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5901488/>
- Pennachin, C. & Goertzel, B. (2007). Contemporary approaches to artificial general intelligence. In B. Goertzel & C. Pennachin (Eds.). *Artificial General Intelligence*, pp. 1-30, Berlin, Heidelberg: Springer Berlin Heidelberg.

- Portugal, D., Alvito, P., Christodoulou, E., Samaras, G. & Dias, J. (2018). A Study on the Deployment of a Service Robot in An Elderly Care Center. *International Journal of Social Robotics*
- Prazak, B., Kronreif, G., Hochgatterer, A., & Fürst, M. (2004). A toy robot for physically disabled children. *Technology and Disability*, 16(3), pp. 131-136.
- Reinkensmeyer, D. J., Kahn, L. E., Averbuch, M., McKenna-Cole, A., Schmit, B. D., & Rymer, W. Z. (2014). Understanding and Treating Arm Movement Impairment After Chronic Brain Injury: Progress with the ARM guide. *Journal of Rehabilitation Research and Development*, 37(6), 653-662.
- Russell, S., Dewey, D. & Tegmark, M. (2016). Research priorities for robust and beneficial artificial intelligence. arXiv preprint arXiv:1602.03506
- Sandia Report. (2008). Robotics and Intelligent Machines, In: the U.S. Department of Energy; Critical Technology Roadmap, October available online www.robotics.ost.doe.gov/reports/rimroadmap.pdf.
- Sarabia, M., Young, N., Canavan, K., Edginton, T., Demiris, Y. & Vizcaychipi, M. P. (2018). Assistive Robotic Technology to Combat Social Isolation in Acute Hospital Settings. *International Journal of Social Robotics*, 10, pp. 607-620.
- Sharkey, A., & Sharkey, N. (2012). Granny and The Robots: Ethical Issues in Robot Care for The Elderly. *Ethics And Information Technology*, 14(1), pp. 27-40.
- Siau, K., & Wang, W. (2020). Artificial intelligence (AI) ethics: ethics of AI and ethical AI. *Journal of Database Management (JDM)*, 31(2), 74-87.
- Tanaka, F., Isshiki, K., Takahashi, F., Uekusa, M., Sei, R., & Hayashi, K. (2015). Pepper Learns Together with Children: Development of An Educational Application. Paper presented at the Humanoid Robots (Humanoids), In: IEEE-RAS 15th International Conference.
- Torta, E., Werner, F., Johnson, D. O., Juola, J. F., Cuijpers, R. H., Bazzani, M., Bregman, J. (2014). Evaluation of A Small Socially Assistive Humanoid Robot in Intelligent Homes for The Care of The Elderly. *Journal of Intelligent & Robotic Systems*, 76(1), pp. 57-71.

Waldner, A., Werner, C., & Hesse, S. (2008). Robot Assisted Therapy in Neurorehabilitation. *Europa Medicophysica*, 44(3), pp. 6-8.

Wood, L. J., Robins, B., Lakatos, G., Syrdal, D. S., Zarak, A. & Dautenhahn, K. (2019): Developing A Protocol and Experimental Setup for Using a Humanoid Robot to Assist Children with Autism to Develop Visual Perspective Taking Skills. *Paladyn, Journal of Behavioral Robotics*, 10, pp. 167-179

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