

Malnutrition Detection Using AI

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***Abstract:** Malnutrition is a leading cause of child mortality in many countries. Identifying malnourished children can help reduce the likelihood of death and treat or minimize health problems. A balanced diet is essential for providing energy and enabling cells to function properly. Insufficient nutrition during pregnancy and childbirth can lead to various health complications later in life, such as underweight, brittle hair and nails, mental illness, stunting, and wasting. Malnutrition occurs when a person's diet is either excessively rich in some nutrients or lacking in one or more essential nutrients, resulting in symptoms like underweight, stunting, and wasting. In India, many children with mild to moderate undernutrition go unnoticed, leading to stunted growth. Early detection of malnutrition can improve health outcomes and reduce healthcare costs. To this end, a system utilizing Convolutional Neural Networks (CNNs) and Transfer Learning has been proposed to analyze input images of children and distinguish between normal and malnourished children. The system aims to automate the identification of child malnutrition to reduce the impacts caused by malnutrition, benefiting healthcare professionals and families.*

Keywords: Malnutrition, Deficiency, Malnutrition, Deep learning, CNN.

REFERENCES

- [1] A. S. Vaidya, G. Makkena, V. Srihari, M. B. Srinivas and S. K. Rao, "A sustainable solution for monitoring malnutrition in children in developing countries," 2013 IEEE Global Humanitarian Technology Conference: South Asia Satellite (GHTC-SAS), 2013, pp. 170-174, DOI: 10.1109/GHTC-SAS.2013.6629910.
- [2] M. M. Shahriar, M. S. Iqbal, S. Mitra and A. K. Das, "A Deep Learning Approach to Predict Malnutrition Status of 0-59 Month's Older Children in Bangladesh," 2019 IEEE International Conference on Industry 4.0, Artificial Intelligence, and Communications Technology (IAICT), 2019, pp. 145-149, DOI: 10.1109/ICIAICT.2019.8784823.
- [3] S. Jain, T. Khanam, A. J. Abedi and A. A. Khan, "Efficient Machine Learning for Malnutrition Prediction among under-five children in India," 2022 IEEE Delhi Section Conference (DELCON), 2022, South Asia Satellite (GHTC-SAS), 2013, pp. 1-10, DOI: 10.1109/DEL-CON54057.2022.9753080
- [4] A. Thapar and M. Goyal, "A fuzzy expert system for diagnosis of malnutrition in children," 2016 IEEE Region 10 Humanitarian Technology Conference (R10-HTC), 2016, pp. 1-6, DOI: 10.1109/R10-HTC.2016.7906819.
- [5] A. R. Lakshminarayanan, P. B. R. V. S. Parthasarathy, A. A. Azeez Khan and K. Javubar Sathick, "Malnutrition Detection using Convolutional Neural Network," 2021 Seventh International conference on Bio Signals, Images, and Instrumentation 2021, pp. 1-5, DOI 10.1109/ICBSII51839.2021.94451884
- [6] A. Maitra, R. E. Rote and N. Kuntagod, "Managing child malnutrition via digital enablement: Insights from a field trial," 2017 IEEE Global Humanitarian Technology Conference (GHTC), 2017, pp. 17, DOI:10.1109/GHTC.2017.8239273.
- [7] X. Dezhi and G. U. Ganegoda, "Multi Agent System to Reduce Malnutrition (MASRM) in Children," 2010 International Conference on Computational Intelligence and Software Engineering, 2010, pp. 1-4, DOI: 10.1109/CISE.2010.567680.
- [8] C. Hayat and B. Abian, "The Modeling of Artificial Neural Network of Early Diagnosis for Malnutrition with Backpropagation Method," 2018 Third International Conference on Informatics and Computing (ICIC), 2018, pp. 1-7, DOI:10.1109/IAC.2018.8780505.
- [9] Kadam, N., Dabhade, V., Baravkar, R., Saravade, V., & Mankar, C. (2019). Detect Malnutrition in Underage Children by using TensorFlow Algorithm of Artificial Intelligence. (Vol. 06, Issue 12)

- [10] Mohseni, M., Aryankhesal, A., & Kalantari, N. (2019). Prevention of malnutrition among children under 5 years old in Iran: A policy analysis. PloS one, 14(3), e0213136.
- [11] Madhuri Arya, Pooja Chavhan and Ujjwala Chaudhry, [2015], 'Malnutrition Detection and Management System', International Journal of Computer Science and Information Technology Research (Vol. 3, Issue 1, pp: (364-368))
- [12] Dezhi, X., & Ganegoda, G. U. (2011). Rule based classification to detect malnutrition in children. International Journal on Computer Science and Engineering (IJCSE) Vol, 3.
- [13] Malnutrition is a world health crisis, [2019], WHO. [://www.who.int/nutrition/topics/world-food-day-2019-malnutrition-world-health-crisis/en](http://www.who.int/nutrition/topics/world-food-day-2019-malnutrition-world-health-crisis/en).
- [14] Markos, Z., Doyore, F., Yifiru, M., & Haidar, J. (2014). Predicting Under nutrition status of under-five children using data mining techniques: The Case of 2011 Ethiopian Demographic and Health Survey. J Health Med Inform, 5, 152.
- [15] Mohseni, M., Aryankhesal, A., & Kalantari, N. (2019). Prevention of malnutrition among children under 5 years old in Iran: A policy analysis. PloS one, 14(3), e0213136.