# TITLE- DEEP LEARNING MODEL FOR TONGUE CANCER CLASSIFICATION

**Sajad ABDLKADHIM**

**Karabük Üniversitesi, Mühendislik Fakültesi, Yazılım Mühendisliği Bölümü, Karabük, Türkiye.**

**0009-0003-5648-4382**

**Sait DEMİR**

**Karabük Üniversitesi, Mühendislik Fakültesi, Yazılım Mühendisliği Bölümü, Karabük, Türkiye.**

**0000-0001-8891-4082**

**Ashwan A. Abdulmunem[[1]](#footnote-1)\***

**University of Kerbala, College of Computer science and information technology, Kerbala, Iraq.**

**0000-0002-1903-9269**

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| **ABSTRACT**  The advancement in computer vision and technology motivated its deployment in various life applications, medical uses of computer vision was one of the main focal of the technology. Image processing with artificial intelligence were the main tool used for medical diagnosis. In this paper, tongue images are used to classify the health. Two classifiers are used namely artificial neural network (FFNN) and Convolutional neural network (CNN). Features extraction also performed using two techniques namely wavelet and image coding. The results show that image coding-based features extraction has optimum results with both FFNN and CNN.  **References:**  [1] T.J.W. Klein Nulent et al. Intraoral ultrasonography to measure tumor thickness of oral cancer: a systematic review and meta-analysis, Oral Oncol (2018).  [2] Y. Shinozaki et al. Relationship between appearance of tongue carcinoma on intraoral ultrasonography and histopathologic findings, Oral Surg Oral Med Oral Pathol Oral Radiol (2014).  [3] A. Yesuratnam et al., Preoperative evaluation of oral tongue squamous cell carcinoma with intraoral ultrasound and magnetic resonance imaging—comparison with histopathological tumour thickness and accuracy in guiding patient management, Int J Oral Maxillofac Surg (2014).  [4] A. Kaneoya et al., Quantitative analysis of invasive front in tongue cancer using ultrasonography, J Oral Maxillofac Surg. (2009).  [5] S. Shintani et al., Intraoral ultrasonography is useful to evaluate tumor thickness in tongue carcinoma. Am J Surg. (1997).  [6] T.M. Pimenta Amaral et al., Predictive factors of occult metastasis and prognosis of clinical stages I and II squamous cell carcinoma of the tongue and floor of the mouth. Oral Oncol. (2004).  [7] L. Lam et al., Retrospective study of survival and treatment pattern in a cohort of patients with oral and oropharyngeal tongue cancers from 1987 to 2004. Oral Oncol (2007).  [8] T. T. Deng, “Basic theory of traditional Chinese medicine,” in Diagnostics of Chinese Medicine, pp. 5–11, Chih-Yin Publishing, Taipei, Taiwan, 1995.  [9] C. H. Li and P. C. Yuen, “Tongue image matching using color content,” Pattern Recognition, vol. 35, no. 2, pp. 407–419, 2002.  [10] Y. Wang, Y. Zhou, and J. Yang, “A tongue analysis system for tongue diagnosis in traditional Chinese medicine,” in Proceedings of the International Symposium Computational and Information Science (CIS ’04), vol. 3314 of Lecture Notes in Computer Science, pp. 1181–1186, Springer, 2004.  [11] Y.-G. Wang, J. Yang, Y. Zhou, and Y.-Z. Wang, “Region partition and feature matching based color recognition of tongue image,” Pattern Recognition Letters, vol. 28, no. 1, pp. 11–19, 2007. |

# Keywords: Tongue images, Wavelet, Coding, CNN.

1. \* Corresponding author. *e-mail address: .........@.........* [↑](#footnote-ref-1)