

पेटेंट कार्यालय  
शासकीय जर्नल

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पेटेंट कार्यालय का एक प्रकाशन  
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(54) Title of the invention : A MULTI-CHANNEL NEURAL CODEC SYSTEM FOR DISENTANGLING COMMON AND TASK-SPECIFIC INFORMATION IN MULTI-TASK VISION PROCESSING

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| (51) International classification             | :G06N<br>3/04, G06T<br>9/00, G06N<br>3/08, H04N<br>19/60,<br>H04N<br>19/124 | (71) <b>Name of Applicant :</b><br><b>1)Noida Institute of Engineering and Technology (NIET)</b><br>Address of Applicant :19, Institutional Area, Knowledge Park II, Greater<br>Noida, Uttar Pradesh 201310 Uttar Pradesh India<br>(72) <b>Name of Inventor :</b><br><b>1)Upasna</b><br><b>2)Shivani Sharma</b> |
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## (57) Abstract :

The present invention relates to a multi-channel neural codec system (100) for separating shared and task-specific information across multiple computer vision tasks. The system includes a hardware platform (101) with a processor (102) and memory (103), and dual analysis transform networks (104, 105) that generate quantized representations from input data. A representation masking module (106) extracts and combines common features, while three entropy model units (107, 108, 109) produce probability distributions for efficient arithmetic coding of common and private channels. Dual synthesis transform networks (110, 111) with task-specific decoders generate final predictions. The system uses a configurable parameter to balance shared and task-specific data transmission, reducing redundancy in distributed inference. It achieves about 81.58% bitrate reduction compared to single-task codecs while maintaining accuracy, with applications in autonomous vehicles, robotics, surveillance, and edge computing.

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