Neural network diagnoses heart disease

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A deep neural network can be used to classify coronary artery disease from clinical heart disease features, according to new work published in the *International Journal of Dynamical Systems and Differential Equations.*

D. Rajeswari and K. Thangavel of the Department of Computer Science at Periyar University in Salem, India, explain that coronary artery disease is a major cause of death across the globe. Early detection of the disease, however, can allow timely interventions that can lower the patient's risk of heart failure. To this end, the team has developed a prediction model that uses a neural network to process non-invasive clinical data.

The network trained on many known cases can then identify the pertinent characteristics when presented with data from a new patient and offer a prognosis that would otherwise remain hidden without major invasive, investigative work. Patients with coronary artery disease present with various symptoms including the expected chest pain, but also fatigue, shortness of breath, dizziness, and pain in the shoulders. A definitive clinical diagnosis is complicated and usually requires electrocardiography, biomedical lab tests, patient stress and treadmill tests. A simpler approach that could be used to assess patients quickly is warranted.

The researchers have tested their system against the Z-Alizadeh Sani data set held in a repository at the University of California Irvine. The results show that their classifier improves prediction accuracy significantly and is at almost 76% when compared to a well-known classifier method K-nearest neighbor. The result combined with other readily available clinical data or follow-up for a patient could be used to obtain an early diagnosis and so potentially save many lives.

More information: D. Rajeswari et al, Coronary artery disease classification from clinical heart disease features using deep neural network, *International Journal of Dynamical Systems and Differential Equations* (2022). DOI: 10.1504/IJDSDE.2022.123413

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