

Title: CAKRes INNOVATIONS ANNOUNCES SUPER RESOLUTION FOR FLUID DATA TO ALLOW PEOPLE IN SCIENCE TO OBTAIN HIGH SCALED IMAGE DATA FROM COARSE IMAGE DATA

Subtitle: Using Deep Learning to enhance the image quality for use in the physical science domain.

Intro Paragraph: Knoxville, TN–May 1, 2025 – To help researchers and scientists fed up with the low resolution of images, we are developing a toolset that allows us to upscale these images to a higher resolution. Initially, these upscaling techniques will be limited to specific domains eg. vortical flows and we aim to expand this functionality to different use cases spanning several domains.

Customer Problems: It is computationally costly to obtain the high resolution image from the solution of underlying physical laws. Recent advances in machine learning architecture has allowed the researchers to successfully upscale the image resolution in domains like biology, facial recognition, medicine, etc. However, the challenges in the physical domain lie in the fact that upscaling images need to match the physical phenomenon that results in the images. We aim to find an optimal solution to these problems by upscaling the low resolution images that can be obtained with low computational cost, guided by the physical laws. These are bound to be helpful in domains of fluid flow, weather prediction, etc.

Solution: CAKRes addresses this problem by developing a machine learning model that will help us upscale a low-resolution image. We will make use of high and low resolution images to train our models that will learn the mapping from low dimensional space to high resolution image. In addition, we hope to achieve a higher degree of accuracy, conforming to the underlying physical laws. This training will be based on synthetic data obtained from numerically solving the mathematical equations pertaining to the laws of flow physics.

Leader’s Quote: “Our mission is to make high-quality image data accessible to scientists without expensive computations. By applying recent advances in machine learning techniques to fluid flow data and comparing them, we are helping researchers get clear images that match real-world physics.”

Customer Quote: “As a scientist studying fluid dynamics, I often deal with coarser images that make analysis difficult. This tool allows me to get clear, high-quality images, saving me valuable time and effort.”

To learn more, go to [our project page](#).