

# K-Nearest Neighbors Hyperparameter Impact on Video Classification Accuracy vs. Fine-Tuning

Assignee Research

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## Abstract

This report synthesises findings from 3 peer-reviewed papers addressing the following research question: How does the choice of  $k$  in  $k$ -nearest neighbors classification with synthetic video features affect the accuracy gap when compared to fine-tuning, and does this relationship differ across pre-trained. 13 claims were extracted from source literature; 2 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 4.2/10. This report is a machine-generated literature synthesis and does not constitute original research.

## 1 Introduction

This paper examines: Measurement of the CKM angle  $\gamma$  in  $B^{\pm} \rightarrow D \rightarrow K^0_{\text{S}} h^{\pm} h^{\pm}$  decays with a novel approach. Research question: How does the choice of  $k$  in  $k$ -nearest neighbors classification with synthetic video features affect the accuracy gap when compared to fine-tuning, and does this relationship differ across pre-trained video model architectures (e.g., 2D vs. 3D CNNs, Transformers)?.

## 2 Methodology

Systematic literature search across multiple databases yielded 3 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 4.2/10.

## 3 Results

3 papers retrieved. 13 claims extracted; 2 independently verified. Quality review score: 4.2/10.

## 4 Limitations

This report is a machine-generated literature synthesis and does not constitute original research. Automated retrieval and verification may introduce errors or omissions. Review scores reflect automated assessment, not human peer review. Readers should consult primary sources for authoritative information.

## 5 Extracted Claims

Claim	Verified	Confidence
The most precise direct measurement of $\gamma$ to date is from the LHCb experiment through the decays $B \pm \rightarrow D(K^0 S^+ h^-) h \pm$ , where	×	0.10
The reported result of $\gamma = (68.7 + 5.2 - 5.1)$ is statistically limited.	×	0.00
The binned phase-space approach only exploits about 85% of the sensitivity to $\gamma$ .	×	0.07
A novel approach that applies per-event weights to data has been proposed as an alternative.	×	0.11
This method for the determination of $\gamma$ has been found to use the phase-space information more effectively than the binne	×	0.05
The strong-phase differences between the decay amplitudes of $D^0$ and $D^0$ to the $K^0 S^+ h^-$ final states are essential input	×	0.03
The strong-phase differences for the binned approach have been measured by the CLEO and BESIII experiments and are stati	×	0.05
The BESIII data were collected during 2010–2011 and 2021–2022 in $e^+e^-$ collisions at the $\psi(3770)$ threshold, with an integ	✓	0.22
The LHCb data were collected during 2011–2018 in $pp$ collisions at center-of-mass energies of $\sqrt{s} = 7, 8$ and 13 TeV, corre	✓	0.18
The decay channels are the same as those in Ref. [16], namely $B \pm \rightarrow DK \pm$ and $B \pm \rightarrow D \pi \pm$ , where the D meson is reconstructed vi	×	0.03
The amplitude of the $B \rightarrow Dh$ -decay is a superposition of the favored $B \rightarrow D^0 h^-$ and suppressed $B \rightarrow D^0 h^-$ decays.	×	0.03
The hadronic parameters $r_{DhB}$ and $\Delta_{DhB}$ are the ratio and strong-phase difference between the suppressed and favored B- de	×	0.04
The amplitudes are expressed as functions of the squared $K^0 S^+ h^-$ masses, $m^2 \pm$ .	×	0.00

## References

- <http://arxiv.org/abs/2209.09547v2>
- <http://arxiv.org/abs/1405.3628v1>
- <http://arxiv.org/abs/2604.05701v1>