

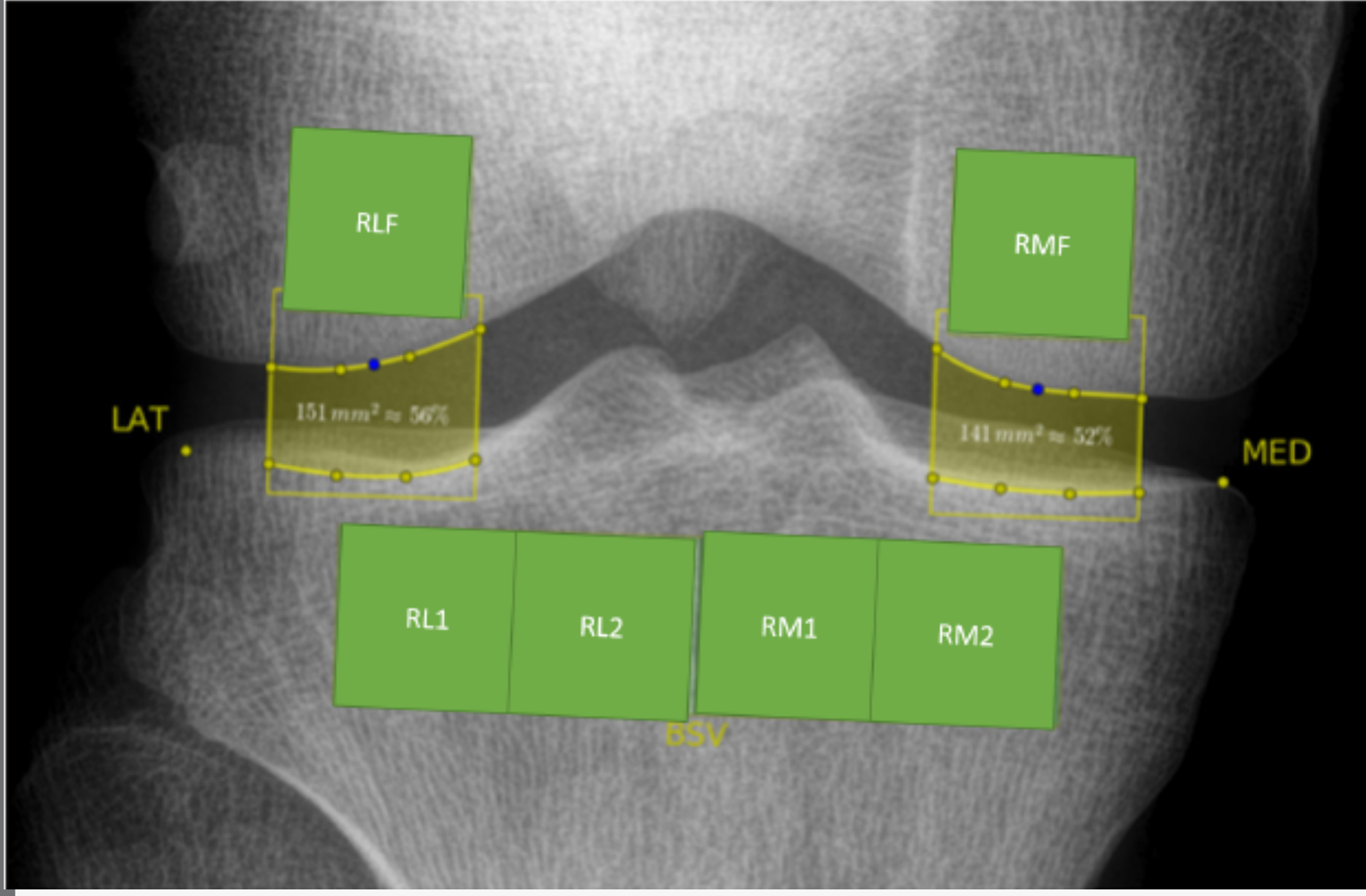
Masterstudium:
Medizinische Informatik

A Comparison of Four Texture Algorithms: Early Detection of Osteoarthritis in the Human Knee Trabecular Bone

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Regions of interest (ROI)



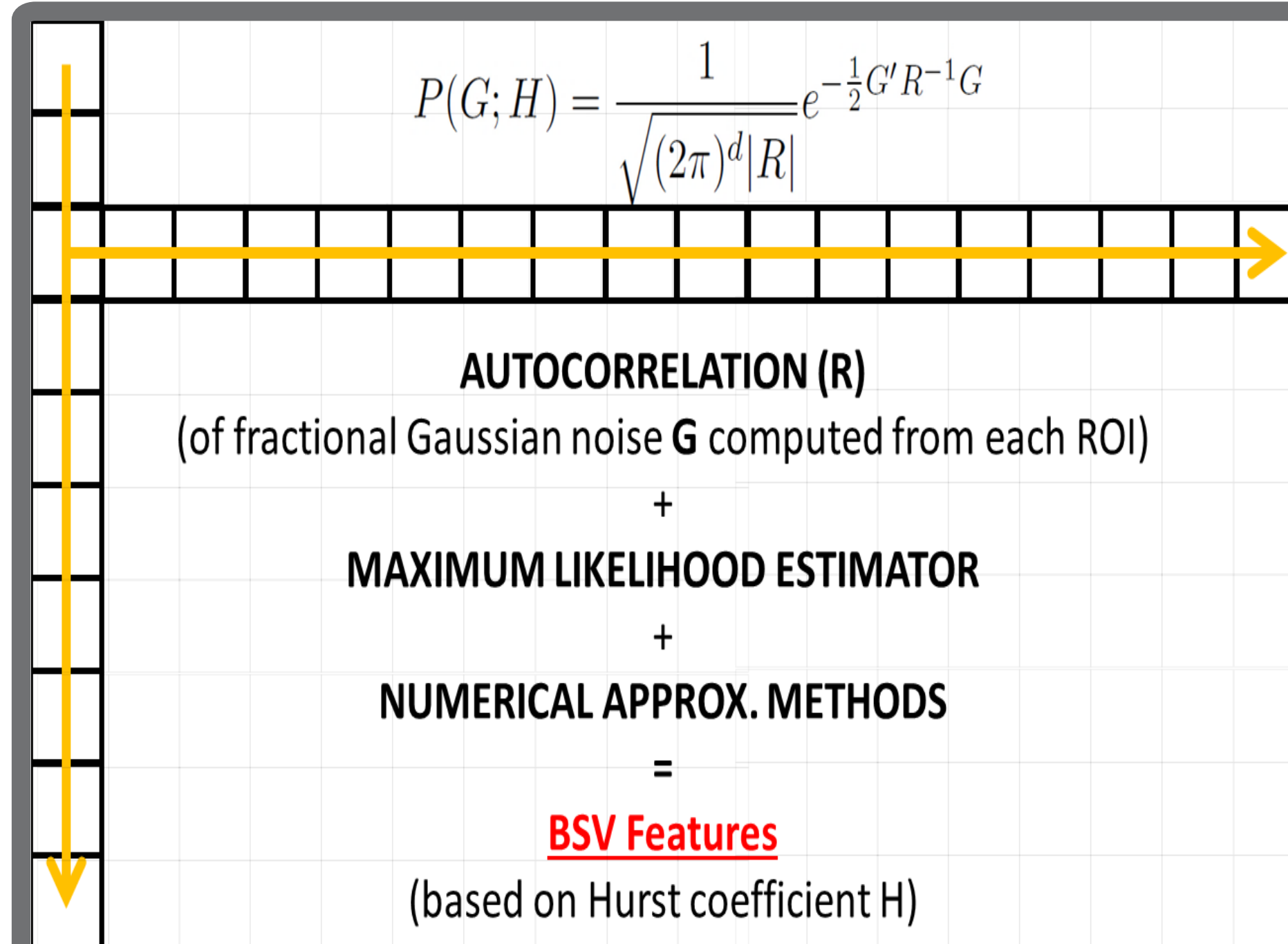
Problem Statement/Motivation

A fully-automated decision-making support system for osteoarthritis (OA) prediction has the potential to significantly lower the high costs associated with its treatment or surgery, provided that the detection of the disease takes place at an early stage.

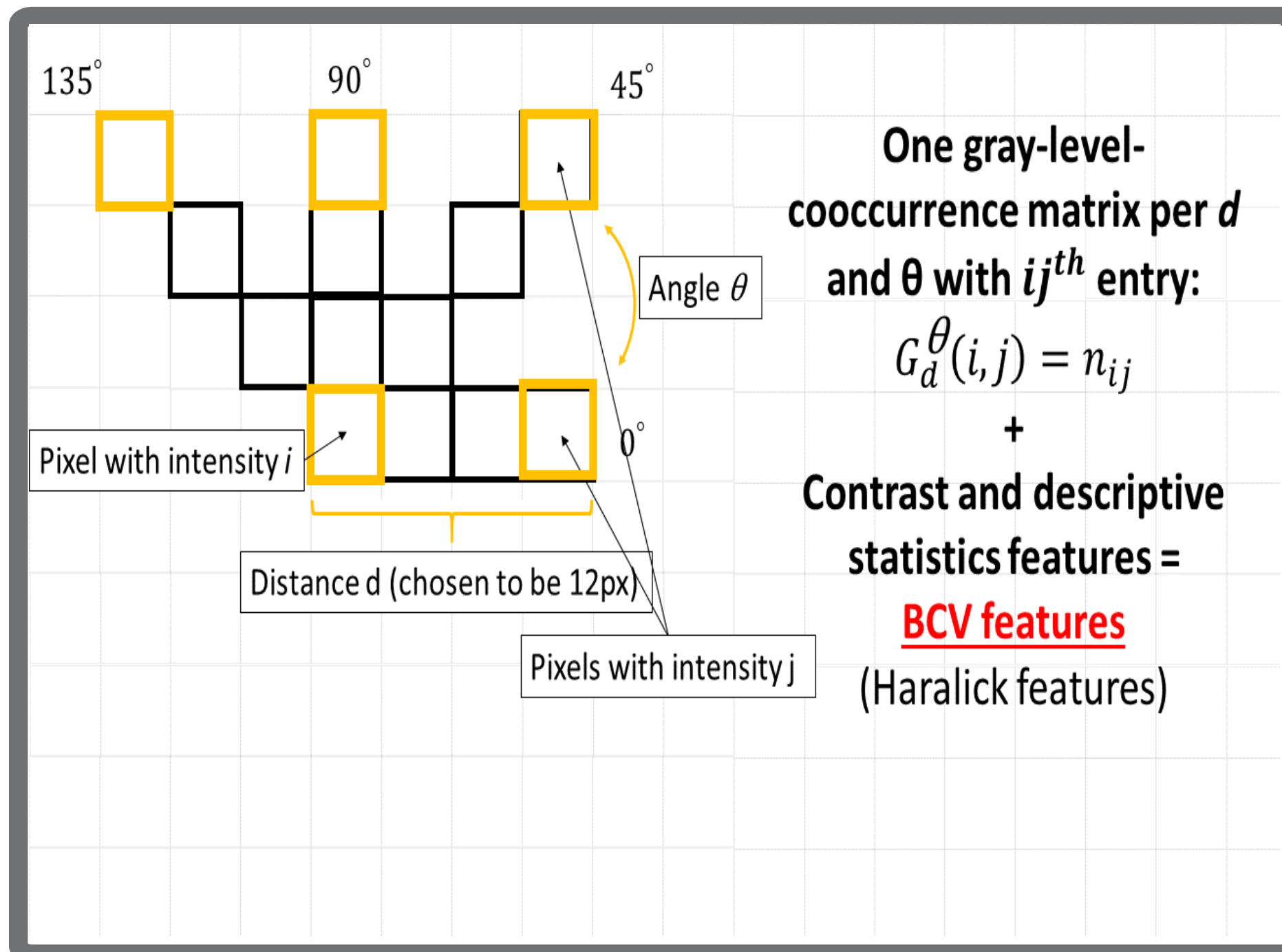
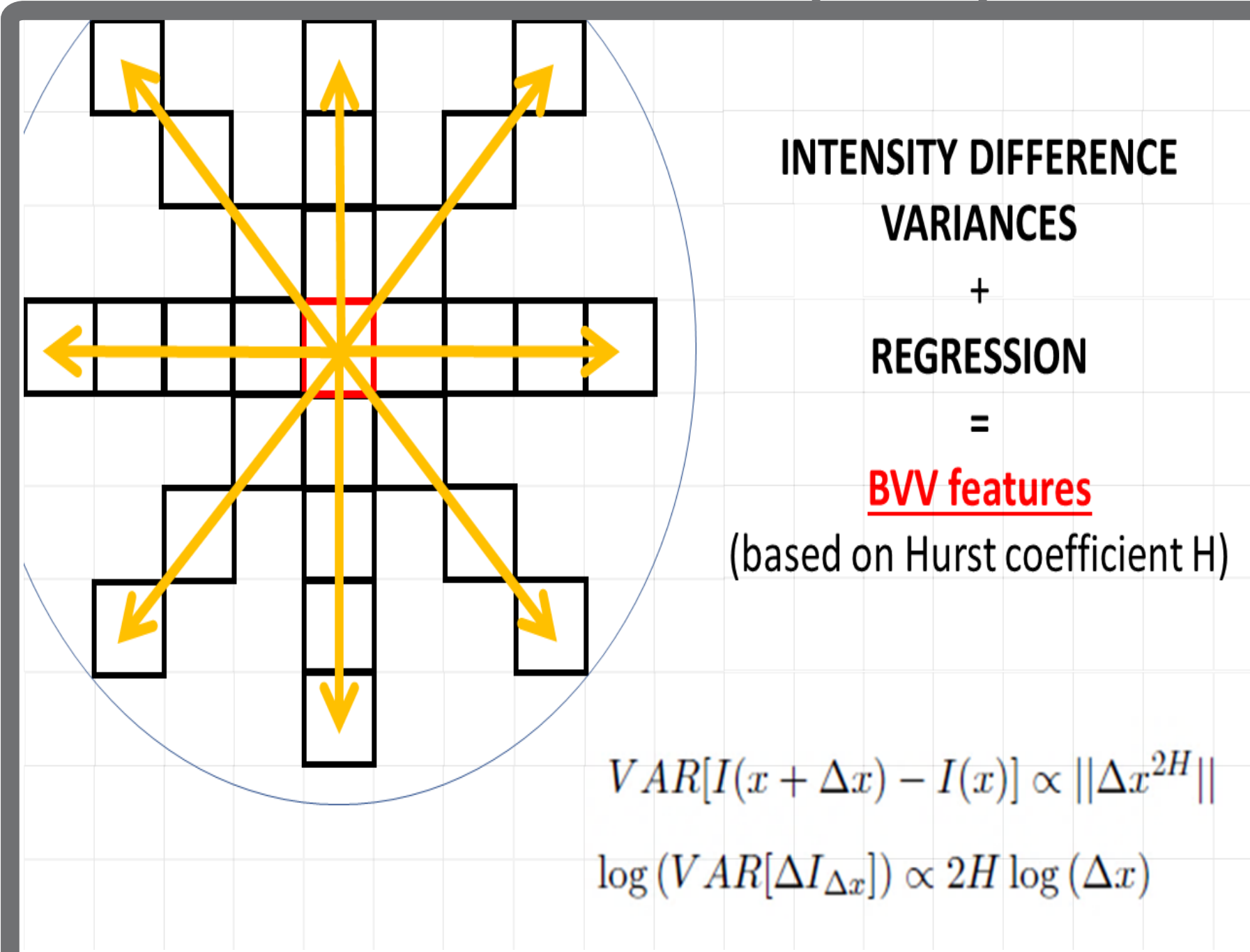
This master thesis provides a comparison among four texture algorithms in their independent or combined capacity of producing significant features that discriminate patients with OA from controls, are sensitive to early signs of OA and that can track disease progression from 2D X-rays of the knee trabecular bone (TB). We show that texture features indeed provide the ability to detect changes due to OA in the 3D underlying TB structure.

Feature Engineering (for each ROI)

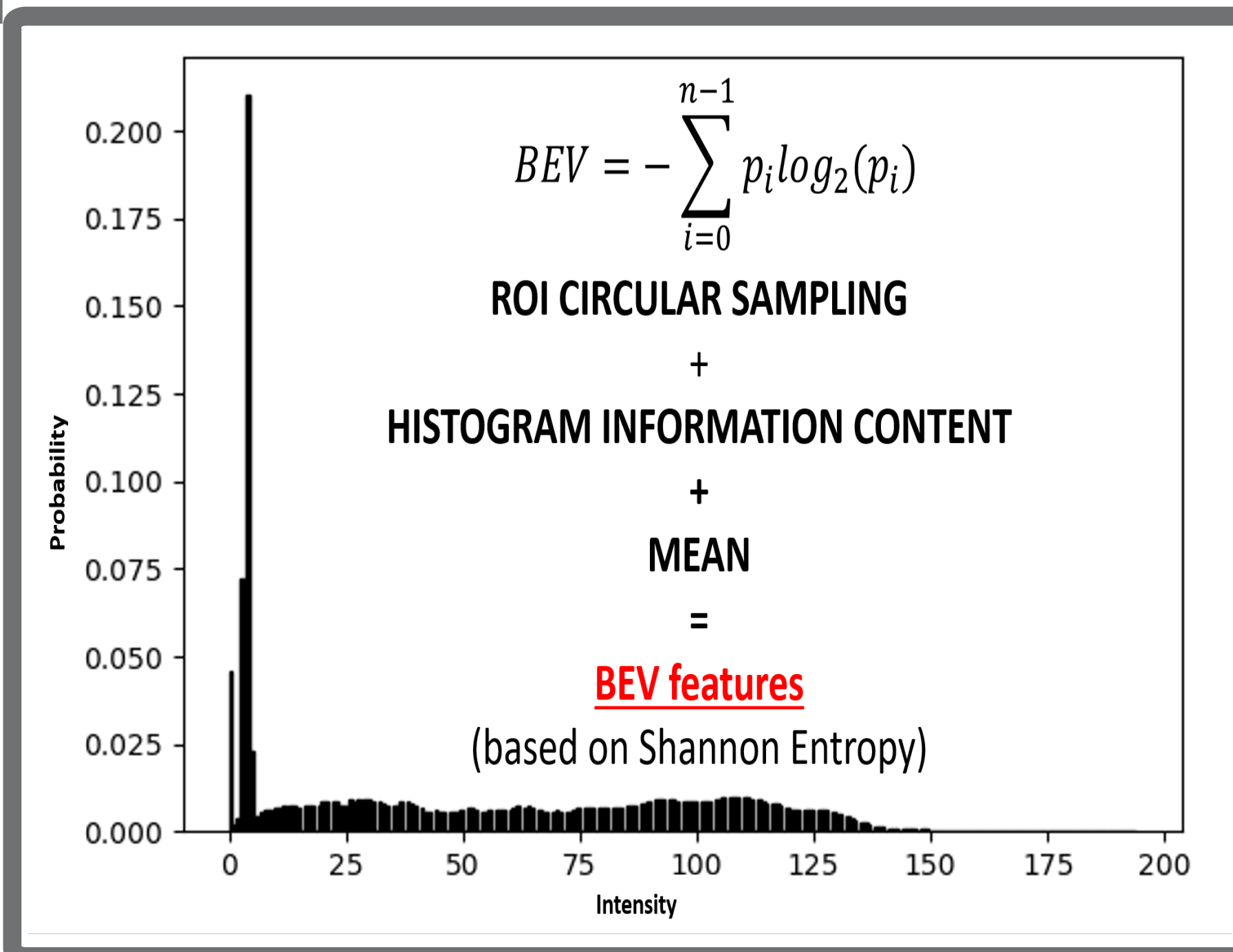
Bone Score Value (BSV)



Bone Variance Value (BVV)



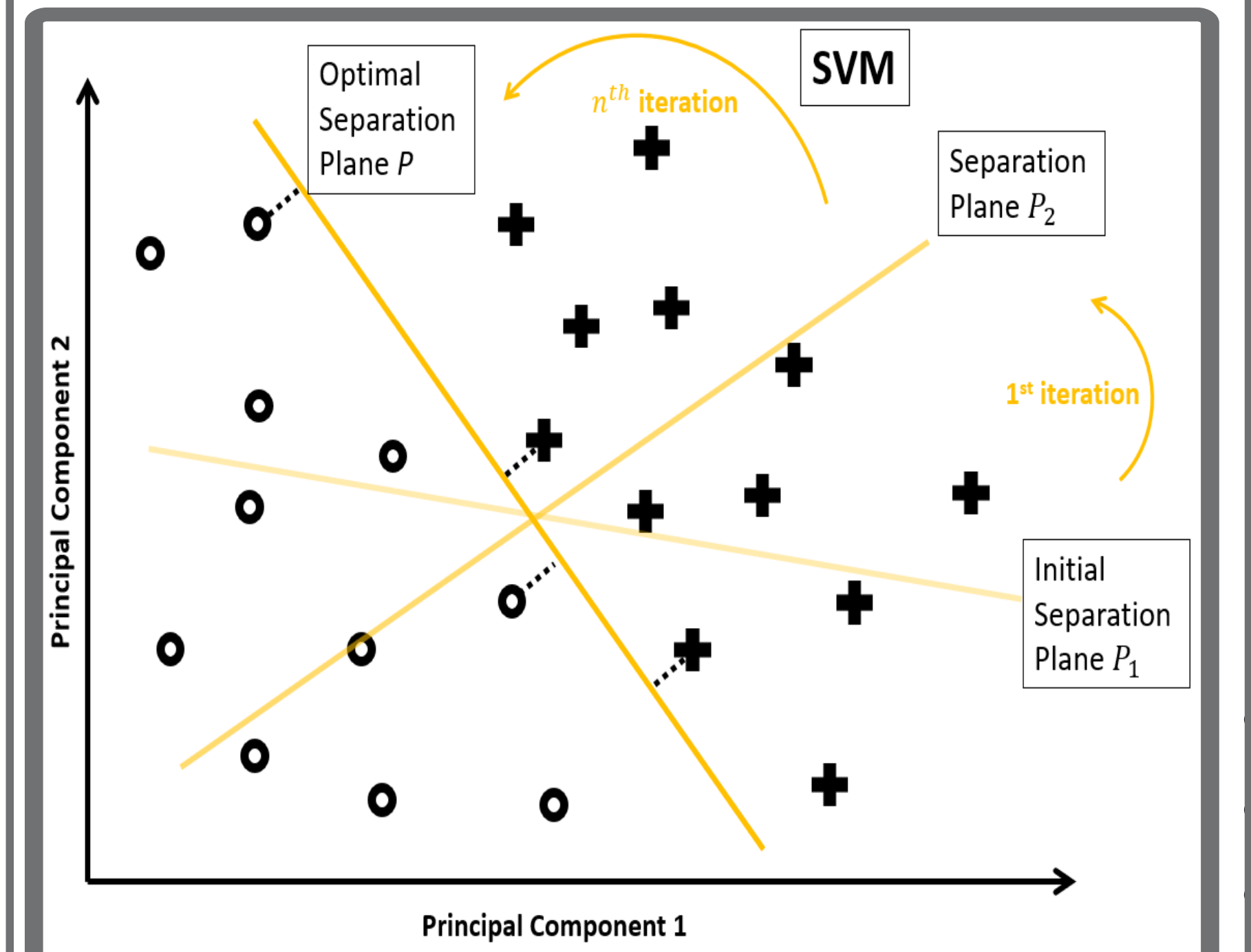
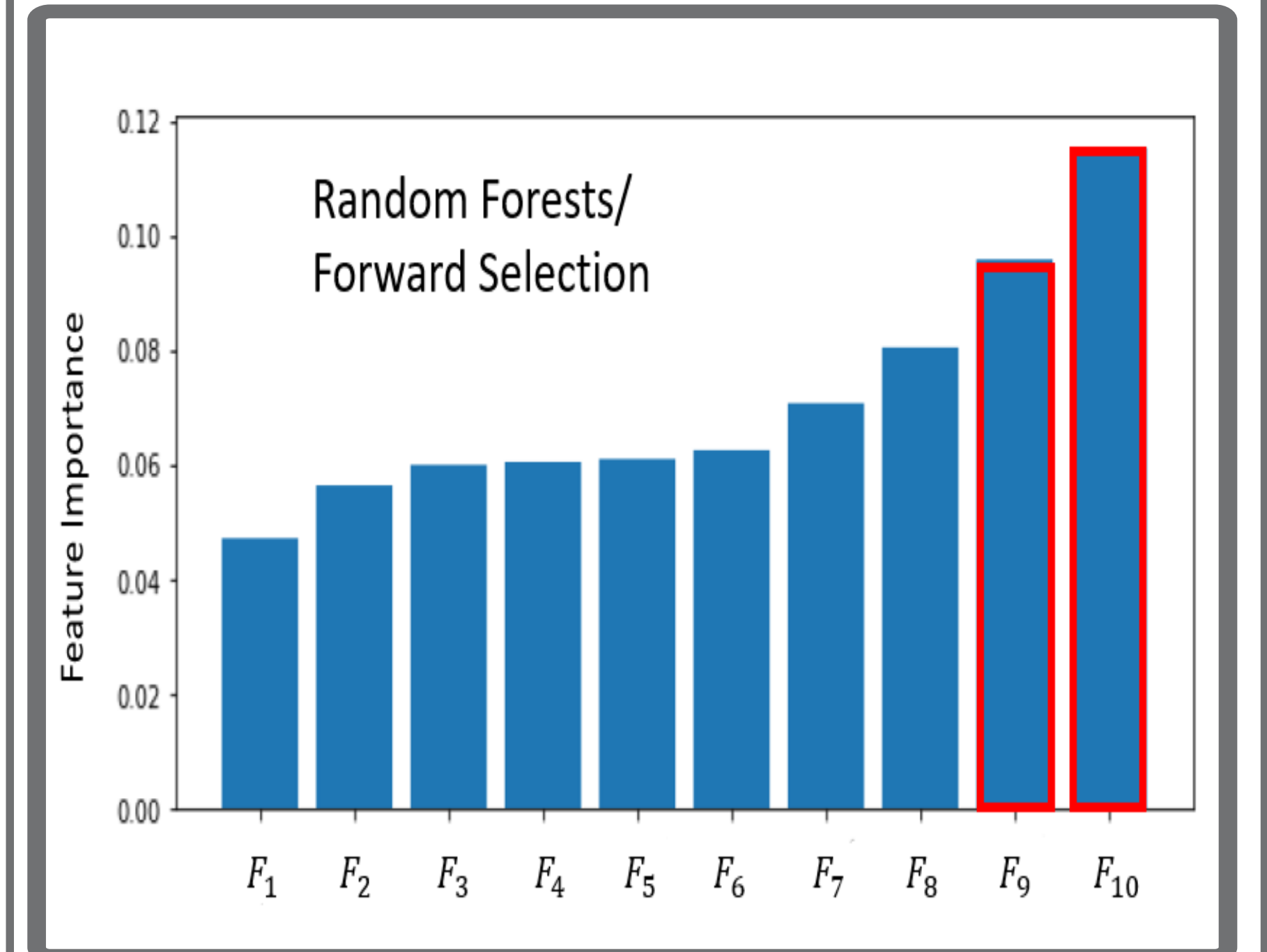
Bone Cooccurrence Value (BCV)



Bone Entropy Value (BEV)

Model Building

Feature Selection



Linear SVM Model Training

Results

