

Exploratory Study of the Cardiac Dynamic Trajectory in the Embedding Space

Jorge Oliveira^{1,2,4} | Bruna Cardoso^{2,3,4} | Miguel Tavares Coimbra^{1,2,4}

¹Instituto de Telecomunicações | ²Faculty of Science | ³Faculty of Medicine | ⁴University do Porto

Introduction

Some cardiac murmurs are generated due to a dysfunction in the heart valves. In this paper, the signal is processed and projected into a more suitable space to detect cardiac murmurs.

Computing ∇H

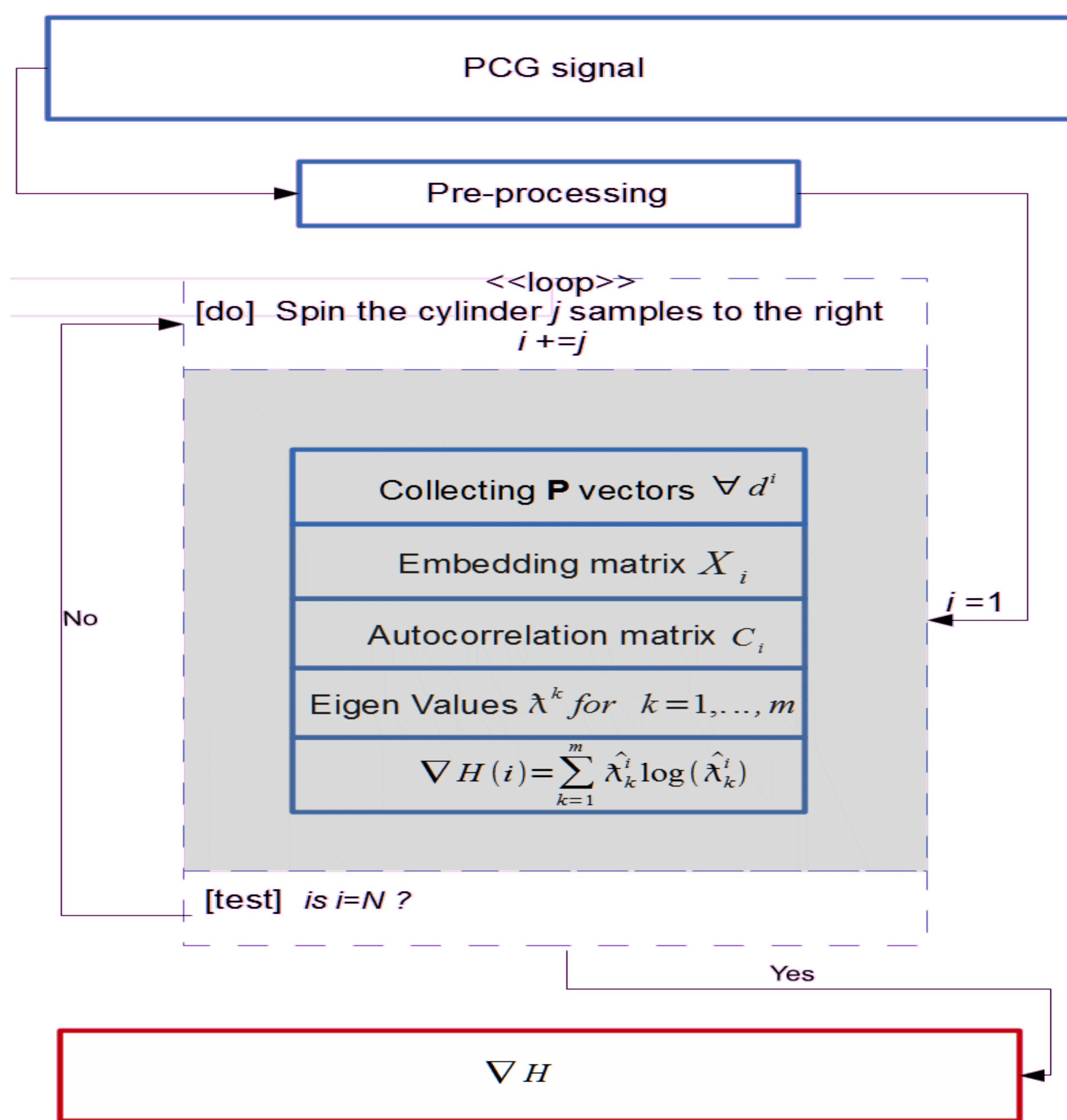


Figure 1: Classical entropy gradient ∇H scheme.

Conclusions

The sensitivity results (Se %) achieved in the mitral (0.70-1%), tricuspid (0.78-1%), pulmonic (0.73-0.78%) and aortic spots (0.75-0.75%) are in agreement with the current state of art for heart murmur classification.

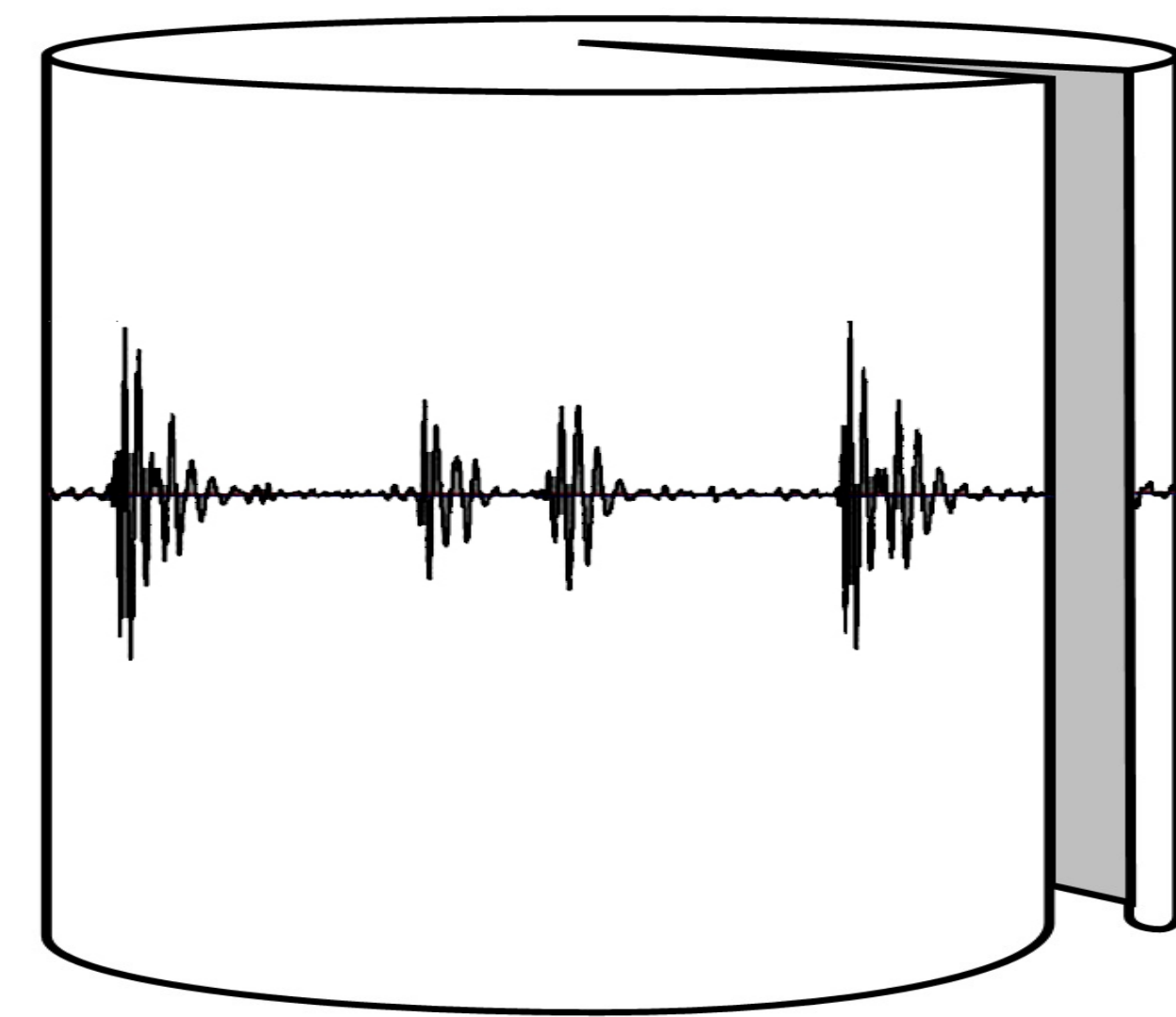


Fig. 2. An infinite PCG signal, obtained by 'wrapping' a finite one around a cylinder.

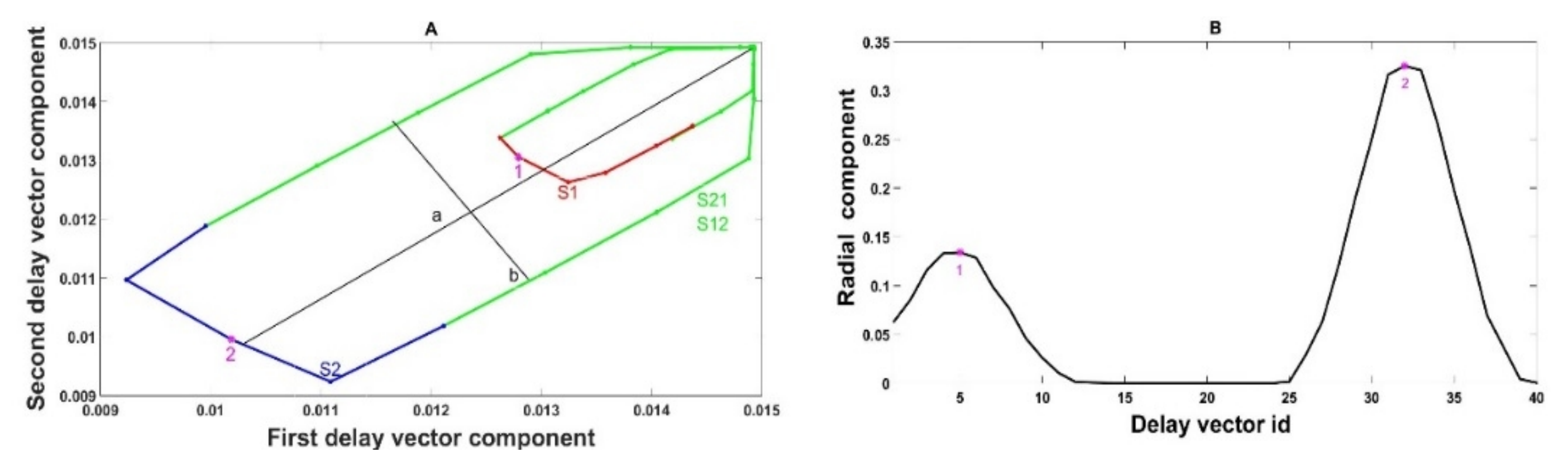


Fig.3(A) Orbital trajectories belonging to a healthy person during a single heart cycle;3(B) Radial component of each delay vector.

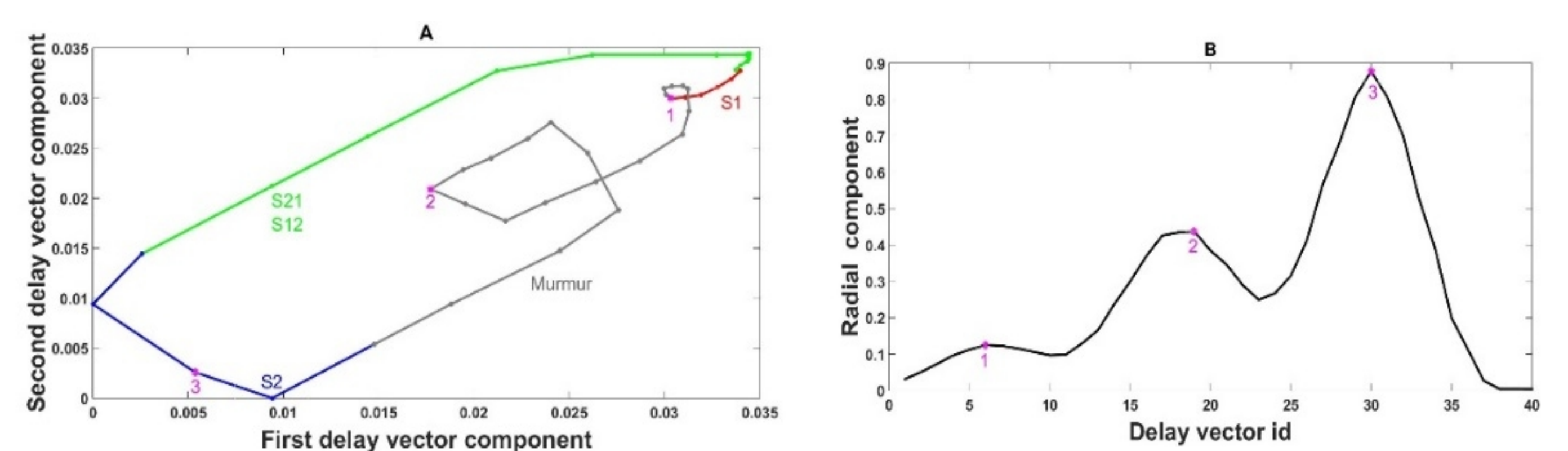


Fig.4(A) Orbital trajectories in the embedding subspace belonging to an individual with heart murmur during a single heart cycle;4(B) Radial component of each delay vector.

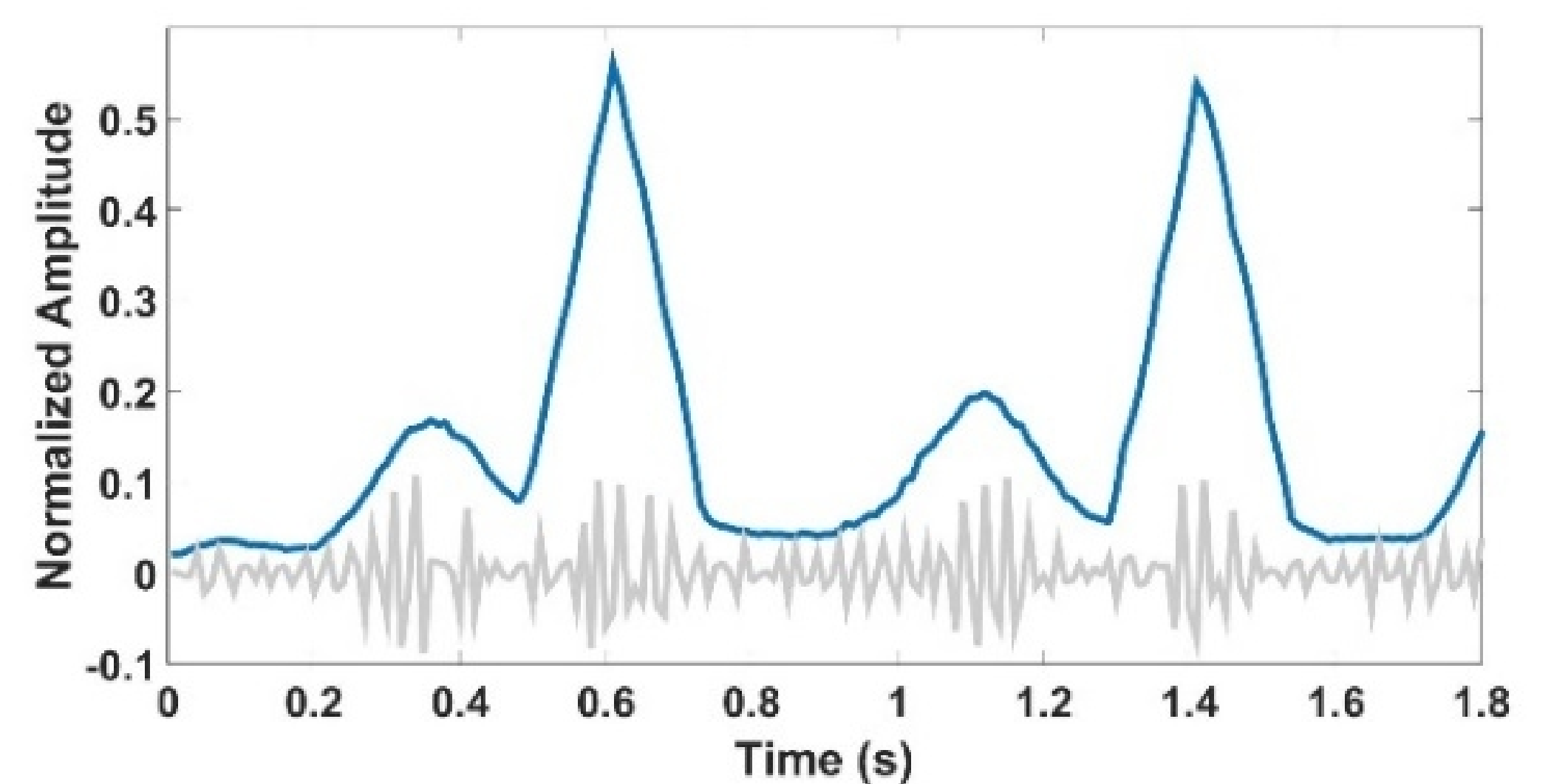


Fig. 5 The ∇H (in blue) and the normalized PCG signal (in gray).

Acknowledgments

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