

# Melody Approximation

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Musical piece: Jesu Bleibet Meine Freude

Author: J.S. Bach

## Melody Approximation

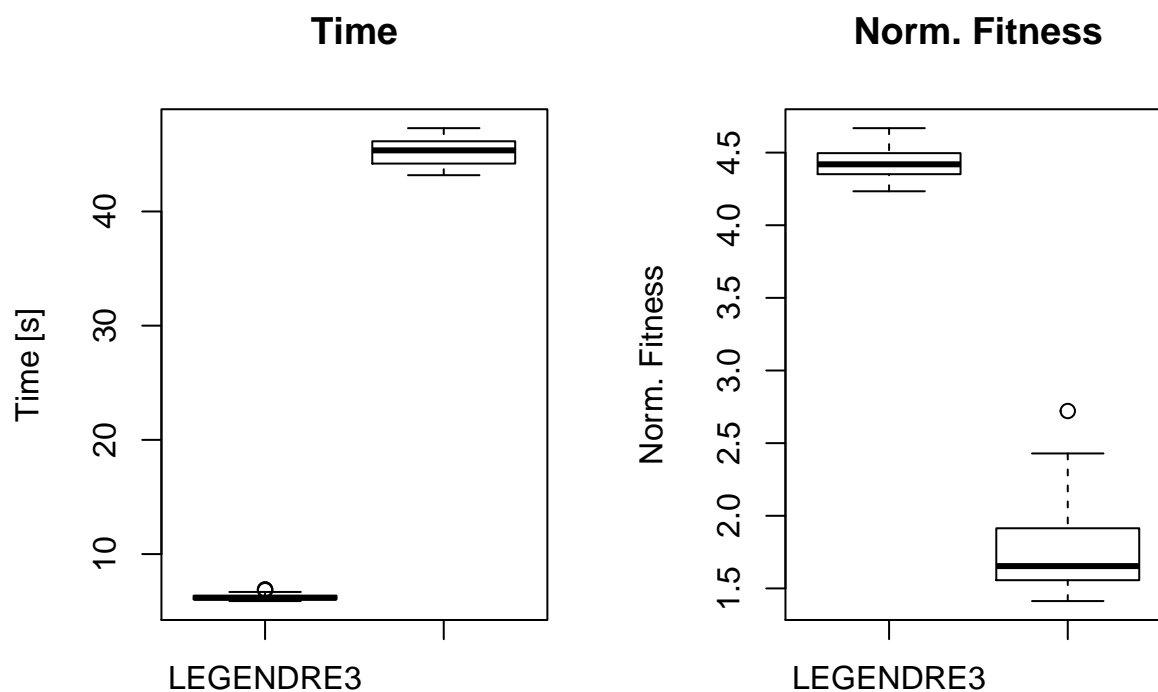
The musical piece was approximated 30 independent times using Legendre and Trigonometric-polynomial approaches, further described in the papers available at <http://neo.lcc.uma.es/staff/acamero/>.

The mean normalized fitness for each approximation function is:

Algorithm	Norm. Fitness
LEGENDRE3	4.436908
POLYTRI_2020128	1.754805

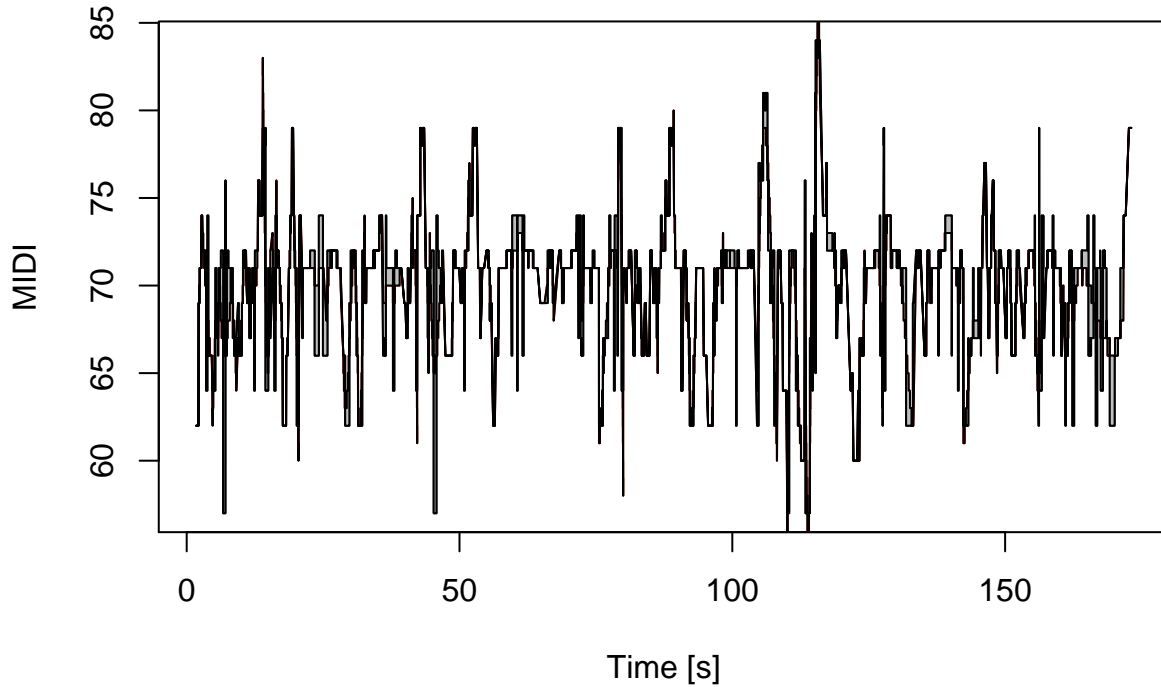
And the mean time for each approximation variant is:

Algorithm	Time [s]
LEGENDRE3	6.232633
POLYTRI_2020128	45.264533



## Legendre 3

The next figure shows the reconstruction of the original melody by Legendre polynomials up to order 3. The differences between the original melody and the approximated one are highlighted in gray.



## Trigonometric-polynomials

The next figure shows the reconstruction of the original melody by Trigonometric-polynomial approach, using 20 sin, 20 cosine and a frequency of interpolation equal to 128. The differences between the original melody and the approximated one are highlighted in gray.

