

## Example Potentials for Spectral Approximation of Generalized Schrödinger Operators via Approximation of Subwords

**Authors:** Fabian Gabel<sup>1</sup>, Dennis Gallaun<sup>1</sup>, Julian Grossmann<sup>1</sup>, Marko Lindner<sup>1</sup> and Riko Ukena<sup>1</sup>.

We provide a collection of the words used as diagonals of operators in Figures 2-7 in the article “Spectral Approximation of Generalized Schrödinger Operators via Approximation of Subwords” by the authors.

The following CSV-formatted files are contained in this folder:

- Figure 2: A word over the alphabet  $\{-3, 3\}$  that contains every possible subword of length 14. This word is used for the spectral approximation of the non-self-adjoint Anderson model.
- Figure 3: Periodic approximations of the Fibonacci word over the alphabet  $\{0, 1\}$  for periods  $2, \dots, 14$ . The words are separated by two linebreaks and are used for the approximation of the standard Fibonacci Hamiltonian.
- Figure 4: The 14-th periodic approximation of the Fibonacci word over the alphabet  $\{0, 1\}$ . In order to obtain the non-self-adjoint operator the word is multiplied by  $-i$ .
- Figure 5: A word over the alphabet  $\{-1, 1\}$  that contains every possible subword of length 12. The word is used for the spectral approximation of Feinberg & Zee’s randomly hopping particle.
- Figure 6: Words over the alphabet  $\{z \in \mathbb{C} : z^3 = 1\}$  that contains every possible subword of length  $m$ , for  $m = 1, \dots, 6$ . The words are separated by two linebreaks and used for the spectral approximation of the 3-state randomly hopping particle.
- Figure 7b and 7c: Words over the alphabets  $\{-2, 2\}$  and  $\{3, 4\}$ , respectively. The couple  $(b, c)$  contains all  $\{-2, 2\} \times \{3, 4\}$  subwords of length 7. The words are used for approximation of the one-way model, where  $b$  is on the main diagonal and  $c$  is on the first subdiagonal.

The words for Figure 3 and Figure 4 were generated by standard techniques for Sturmian words. For Figure 2, 5 and 6 the Python script `word_generation.py` was used with respective parameters. The words for Figure 7 were generated by the Python script `word_generation_bidiagonal.py`.

The spectra of the resulting operators were computed via Floquet-Bloch techniques and a discretization of the unit circle. For the pseudospectra we used a discretization of the plane and determined the smallest singular value.

Contact: Riko Ukena, [riko.ukena@tuhh.de](mailto:riko.ukena@tuhh.de), ORCID: [0000-0001-6078-2954](https://orcid.org/0000-0001-6078-2954)

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<sup>1</sup>Hamburg University of Technology, Institute of Mathematics.