Gutzwiller

variational monte carlo and importance sampling for Rimu.jl

Installation

Gutzwiller.jl is not yet registered. To install it, run

```
import Pkg; Pkg.add("https://github.com/mtsch/Gutzwiller.jl")
```

Usage guide

```
using Rimu
using Gutzwiller
using CairoMakie
using LaTeXStrings
```

First, we set up a starting address and a Hamiltonian

```
addr = near_uniform(BoseFS{10,10})
H = HubbardMom1D(addr)
```

```
ansatz = GutzwillerAnsatz(H)
```

An ansatz is a struct that given a set of parameters and an address, produces a value

```
ansatz(addr, [1.0])
```

In addition, the function `val_and_grad` can be used to compute both the value and its gradient with respect to the parameters.

```
val_and_grad(ansatz, addr, [1.0])
```

we want to optimize the parameter

if the basis of the Hamiltonian is small enough to fit into memory, it's best to use the `LocalEnergyEvaluator`:

```
le = LocalEnergyEvaluator(H, ansatz)
```

It can be used to evaulate the value of the Rayleigh quotient (or its gradient) for a given set of parameters

```
le([1.0])
```

```
val_and_grad(le, [1.0])
```

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