Constrained RDP Algorithm

Constrained simplification of arbitrary polylines in the context of arbitrary planar geometries.

How to use

Open a terminal (command line) from the directory containing constdp[.exe]. Simplification options are made available through the use of TOML file (config.toml). Execute constdp with the following command :

```
./constdp -c ./config.toml
```

If a `-c` option is not provided at the terminal e.g. `./constdp`, it assumes `-c ./config.toml` as default.

config file

```
#input file is required
Input                   = "/path/to/input.[wkt]"
#output is optional, defaults to ./out.txt
Output                  = ""
#this is optional
Constraints             = "/path/to/file.[wkt]"
#options : DP, SED
```

```
SimplificationType     = "DP"
Threshold              = 0.0
MinDist                = 0.0
RelaxDist              = 0.0
#are polylines independent or a feature class ?
#if false planar and non-planar intersections
#between polylines are not observed
IsFeatureClass         = false
#observe planar self-intersection
PlanarSelf             = false
#observe non-planar self-intersection
NonPlanarSelf          = false
#avoid introducing new self-intersections as a
#result of simplification
AvoidNewSelfIntersects = false
GeomRelation           = false
DistRelation           = false
SideRelation           = false
```

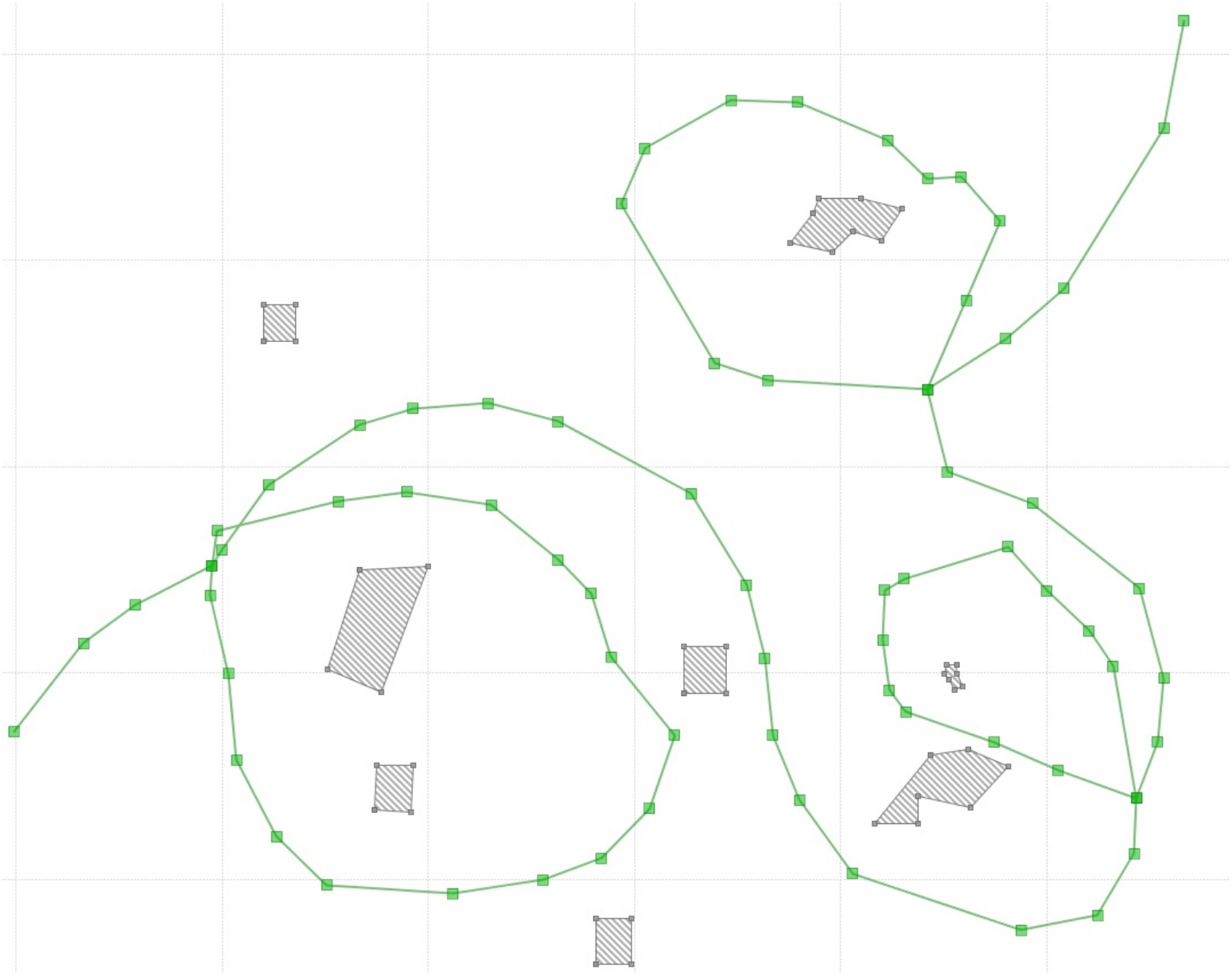
Example

Given a polyline in `resource/input.wkt`

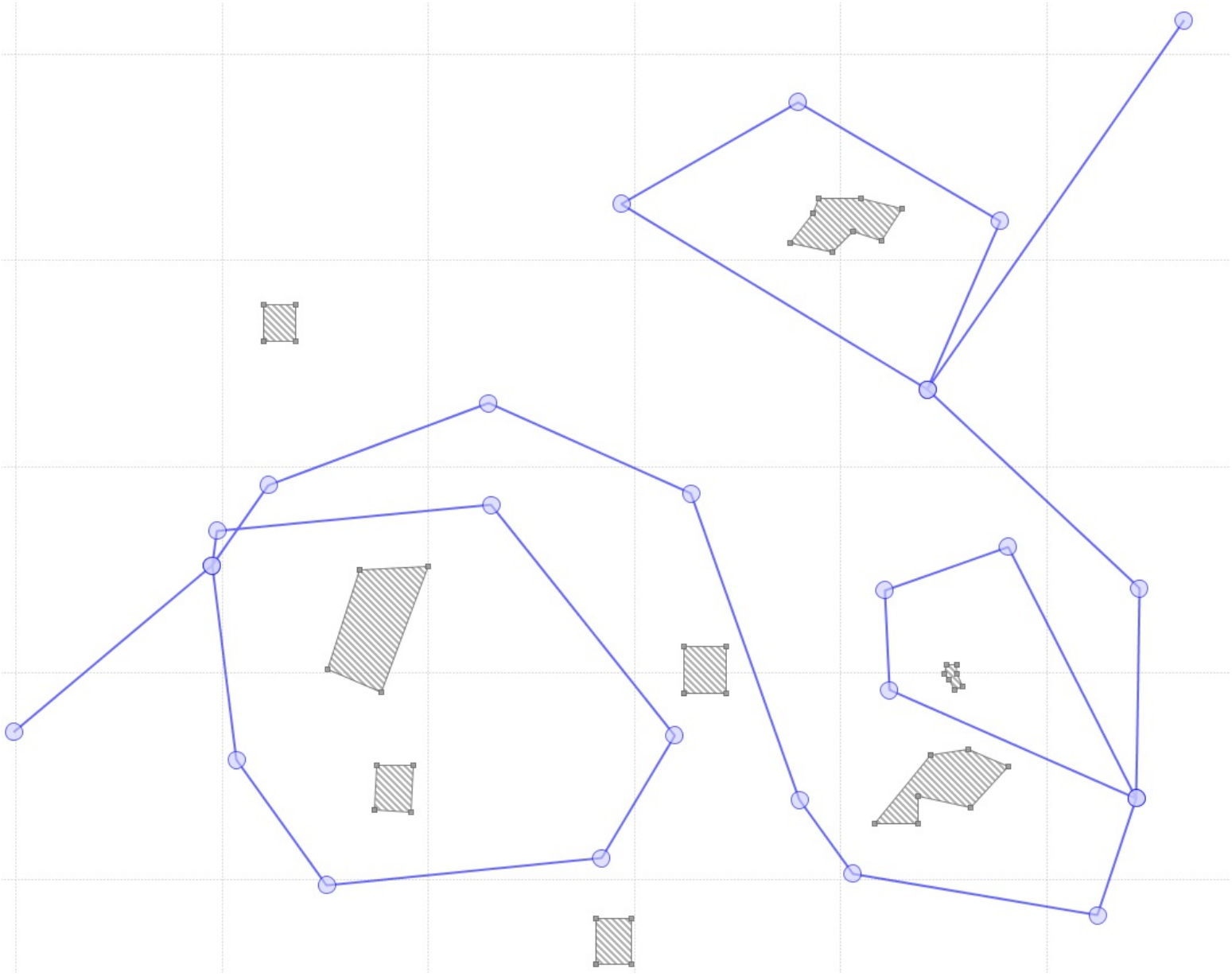
```
Input                  = "resource/input.wkt"
Output                 = ""
Constraints            = "resource/constraints.wkt"
SimplificationType     = "DP"
Threshold              = 50.0
MinDist                = 20.0
```

```
RelaxDist               = 30.0
IsFeatureClass          = false
PlanarSelf              = true
NonPlanarSelf           = true
AvoidNewSelfIntersects = true
GeomRelation            = true
DistRelation            = true
SideRelation            = true
```

Original polyline in the context of planar objects:



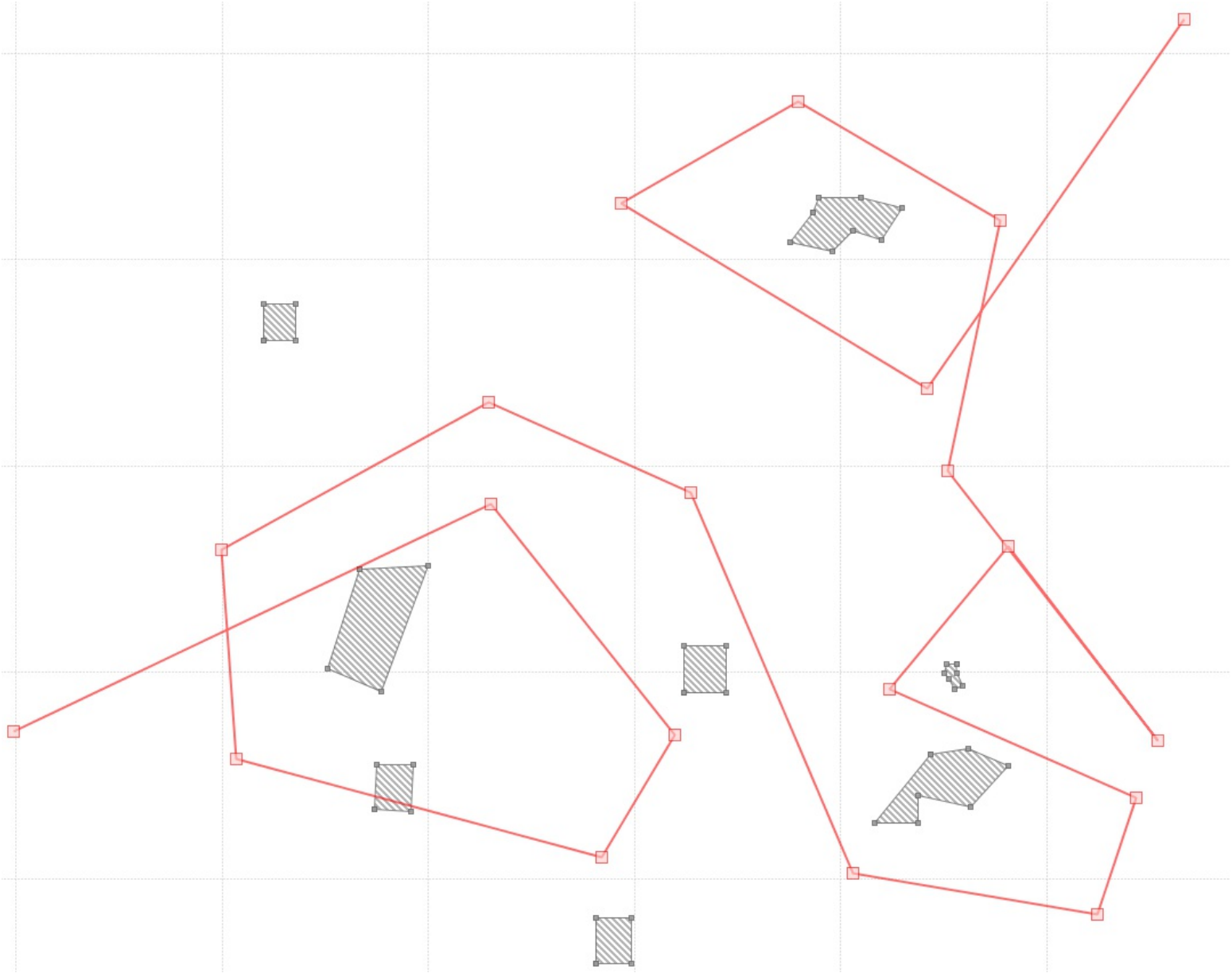
Constrained simplification with respect to config options(above):



Unconstrained simplification with these options turned `false`:

```
IsFeatureClass         = false
PlanarSelf             = false
NonPlanarSelf          = false
AvoidNewSelfIntersects = false
```

```
GeomRelation            = false
DistRelation            = false
SideRelation            = false
```



Constraints