S0.1 Example

This section guides step-by-step employing Smash++ to find and visualize rearrangements between two synthetic sequences. Note that the commands can be run on Linux and macOS, however, they are similar in Windows.

First, install Smash++:

```
git clone https://github.com/smortezah/smashpp.git
cd smashpp
./install.sh
```

Then, copy "smashpp" executable file into "example/" directory and go to that directory:

```
cp smashpp example/
cd example/
```

There is a 1000 byte reference sequence, named "ref", as the following:

```
TCCCGGTCTTTTAGCGGCCAGGGGCCTGGGCTGTATATCGAAAAGTAATATCCCTTTATGCACCGACCGTAATTATGGACAGCAC
ATATACATTATGAGATTTAAAGATCGCGTGGACGACCACGCGGGCTTATAGCCTCACCTGAGGAAGGGGGTGCCTGCGAGGGAGC
TTGAACCTGTAGCCCCAATCTCGAACGACCTGAGGCTTGTGTGGTCAGAGTTGTGACCAGAGCGATCCCGTTGTCAAATCAACCT
AGAGGAGAGGTAAGGGATACGGGTTACATCTCTCCGCTCAGATTGCTCCTATCGGTAGGAAATATCGGGGATAACCCAATACAAA
ACGCTGAACTGTTCATATTTAGCAAGAAGGGGGGACCGAGGAGCTAAATCAGGGACTATGTAAAATTAGAGTTCTAAGGATAGTA
GCACCCGCGCATGGATCGAACTCCGCCTTGGTTGGGTGTGGATGCCATTGGCGTCACCGTGCTGATAGCCAAATCCCTAGTGAAG
GTAACGTGCGGCCAATTAAATAGTAACTGGGCGTAGATTCTAGCGGTGGCCTCATACGGCACCAATGTCCATCCTCCCTGTGCCT
AACACTATAACTCCAATCCCGTGAGTCTACCATCGCCGAGAATCAGACGGGCAACAAACCCAGGGAGCGAGAGCTACGCGGCTTA
TATCACGGATGCTTCCCCACCTAGGGAAATTTGTTCCGCCTAATCCCGTCCTTCGCTGGTCAGGCCCGGTCTAGCGGATTACTTC
GCCGGTAATGCAGTACAGAATAAATGAAATTCATTAAGAGAATGAAAGGTTATCAGCGAAGCCTTAAGGTCCAACAAGACGTCGA
TATTCTGAAGTAAACTGGTTGACATGTGTGTAACATGAAGCACGCGCTTATTGATATTATCCGCAACCCCACGGCTGGCGGGAAT
CAACCGGCGTCCAGTTCGAACAAGACAGTGCGCTACGCATTACGAAATAGGCTTCGTGTTGCTGT
```

and a 1000 byte target sequence, named "tar", in this directory:

```
CAGCAACACGAAGCCTATTTCGTAATGCGTAGCGCACTGTCTTGTTCGAACTGGACGCCGGTTGATTCCCGCCAGCCGTGGGGTT
GCGGATAATATCAATAAGCGCGTGCTTCATGTTACACACATGTCAACCAGTTTACTTCAGAATATCGACGTCTTGTTGGACCTTA
AGGCTTCGCTGATAACCTTTCATTCTCTTAATGAATTTCATTTATTCTGTACTGCATTACCGGCGAAGTAATCCGCTAGACCGGG
CCTGACCAGCGAAGGACGGGATTAGGCGGAACAAATTTCCCTAGGTGGGGAAGCATCCGTGATATAAGCCGCGTAGCTCTCGCTC
CCTGGGTTTGTTGCCCGTCTGATTCTCGGCGATGGTAGACTCACGGGATTGGAGTTATAGTGTTAGGCACAGGGAGGATGGACAT
TGGTGCCGTATGAGGCCACCGCTAGAATCTACGCCCAGTTACTATTTAATTGGCCGCACGTTACCTTCACTAGGATCCCGGTCTT
TTAGCGGCCAGGGGCCTGGGCTGTATATCGAAAAGTAATATCCCTTTATGCACCGACCGTAATTATGGACAGCACATATACATTA
TGAGATTTAAAGATCGCGTGGACGACCACGCGGGCTTATAGCCTCACCTGAGGAAGGGGGGGCCTGCGAGGGAGCTTGAACCTGT
AGCCCCAATCTCGAACGACCTGAGGCTTGTGTGGTCAGAGTGGTGACCAGAGCGATCCCGTTGTCAAATCAACCTAGAGGAGAGG
TAAGGGATACGGGTTACATCTCTCCGCTCAGATTGCTCCTATCGGTAGGAAATATCGGGGATAACCCAATACAAAACGCTGAACT
GTTCATATTTAGTAAGAACGGGTGACCGAGGAGCTAAATCAGGGACTATGTAAAATTAGAGATCTAAGGATAGTAGCACCCGCGC
ATGGATCGAACTCCGCCATGGTTTGGTGTCGATGCCATTGGCGTCACCGTGCTGATAGCCAAATC
```

```
CAGCAACACGAAGCCTATTTCGTAATGCGTAGCGCACTGTCTTGTTCGAACTGGACGCCGGTTGATTCCCGCCAGCCGTGGGGTT
```

Running

```
./smashpp -r ref -t tar
./smashpp -viz -o example.svg ref.tar.pos
```

results in Fig. S1.

a

```
##SMASH++
##PARAM=<-r ref -t tar>
##INFO=<Ref=ref,RefSize=1000,Tar=tar,TarSize=1000>
#RBeg  REnd  RRelRdn  RRdn    TBeg  TEnd  TRelRdn  TRdn    Inv
0      510   0.5108   2.0000  497   1000  0.5120   2.0000  F
498    1000  0.1518   2.0000  508   0     0.1551   2.0000  T
```

b

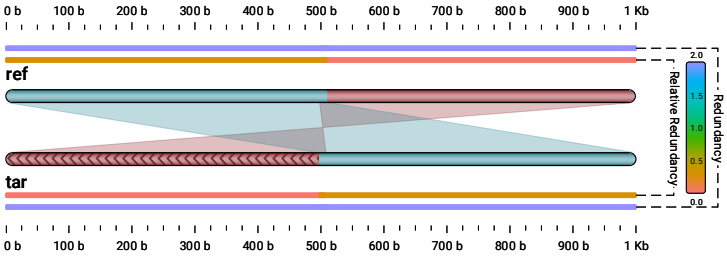

Fig. S1. An example of running Smash++ on two 1000 base sequences. (a) the position file and (b) output of the visualizer. One similar region in regular mode and another similar region in inverted mode are detected.

References