```
>> demo_Polynomial_Dictionary_Learning_Uber
Starting to train the dictionary
solving the quadratic problem with YALMIP...

 num. of constraints = 33
 dim. of socp   var  = 34,   num. of socp blk  =  1
 dim. of linear var  = 174
*******************************************************************
   SDPT3: Infeasible path-following algorithms
*******************************************************************
 version  predcorr  gam  expon  scale_data
   HKM      1      0.000   1        0
it pstep dstep pinfeas dinfeas  gap      prim-obj      dual-obj    cputime
-------------------------------------------------------------------
 0|0.000|0.000|1.0e+00|4.2e+02|4.1e+07| 9.846666e+03  0.000000e+00| 0:0:00| chol  1  1
 1|1.000|0.980|4.0e-06|8.4e+00|8.4e+05| 1.053530e+04 -1.652023e+02| 0:0:00| chol  1  1
 2|1.000|0.931|3.2e-07|6.0e-01|6.8e+04| 1.012021e+04 -9.800820e+00| 0:0:00| chol  1  1
 3|0.373|0.869|2.3e-07|8.6e-02|1.9e+04| 1.040071e+04 -1.026741e+02| 0:0:00| chol  1  1
 4|1.000|1.000|1.2e-07|2.4e-03|3.0e+03| 2.843336e+03 -4.130209e+01| 0:0:00| chol  1  2
 5|0.925|0.918|2.9e-08|8.4e-04|2.3e+02| 2.024086e+02 -2.114518e+01| 0:0:00| chol  2  2
 6|0.414|1.000|2.0e-08|7.1e-05|1.9e+02| 1.724072e+02 -1.535650e+01| 0:0:00| chol  2  1
 7|1.000|0.835|2.6e-09|1.8e-05|1.0e+02| 9.480651e+01 -6.800901e+00| 0:0:00| chol  1  2
 8|1.000|1.000|4.9e-10|7.1e-07|4.3e+01| 3.822465e+01 -5.017691e+00| 0:0:00| chol  1  2
 9|1.000|1.000|1.1e-10|7.1e-08|1.2e+01| 8.886136e+00 -3.547039e+00| 0:0:00| chol  1  2
10|1.000|1.000|5.1e-13|7.1e-09|4.3e+00| 1.042995e+00 -3.249935e+00| 0:0:00| chol  1  1
11|1.000|0.998|1.0e-11|7.2e-10|9.2e-01|-2.108163e+00 -3.031996e+00| 0:0:00| chol  1  1
12|0.844|1.000|2.0e-12|7.2e-11|3.2e-01|-2.640294e+00 -2.955856e+00| 0:0:00| chol  1  2
13|1.000|1.000|1.7e-12|8.1e-12|1.2e-01|-2.819094e+00 -2.937583e+00| 0:0:00| chol  1  2
14|0.957|0.728|3.6e-12|3.7e-12|1.4e-02|-2.914280e+00 -2.928290e+00| 0:0:00| chol  2  2
15|0.855|0.847|1.8e-11|1.6e-12|6.5e-03|-2.919674e+00 -2.926197e+00| 0:0:00| chol  3  3
16|0.912|1.000|5.5e-11|1.5e-12|3.5e-03|-2.922346e+00 -2.925810e+00| 0:0:00| chol  2  2
17|0.950|0.916|1.3e-10|2.4e-12|4.7e-04|-2.925107e+00 -2.925574e+00| 0:0:00| chol  3  3
18|0.957|0.942|2.9e-10|3.5e-12|2.3e-05|-2.925515e+00 -2.925537e+00| 0:0:00| chol  4  3
19|1.000|0.994|7.4e-11|5.1e-12|9.9e-07|-2.925534e+00 -2.925535e+00| 0:0:00| chol
  linsysolve: Schur complement matrix not positive definite
  switch to LU factor. lu 30  30
20|1.000|0.994|2.8e-09|7.6e-12|4.1e-08|-2.925535e+00 -2.925535e+00| 0:0:00|
  stop: max(relative gap, infeasibilities) < 1.00e-07
-------------------------------------------------------------------
 number of iterations   = 20
 primal objective value = -2.92553477e+00
 dual   objective value = -2.92553465e+00
 gap := trace(XZ)       = 4.07e-08
 relative gap           = 5.93e-09
 actual relative gap    = -1.73e-08
 rel. primal infeas     = 2.84e-09
 rel. dual   infeas     = 7.62e-12
 norm(X), norm(y), norm(Z) = 2.1e+01, 5.9e+01, 4.2e+01
 norm(A), norm(b), norm(C) = 3.7e+03, 1.6e+03, 4.6e+01
 Total CPU time (secs)  = 0.13
 CPU time per iteration = 0.01
 termination code       =  0
 DIMACS errors: 6.2e-09  0.0e+00  1.1e-11  0.0e+00  -1.7e-08  5.9e-09
-------------------------------------------------------------------
```

```
ans =

    2.9255


 num. of constraints = 33
 dim. of socp   var  = 34,   num. of socp blk  =  1
 dim. of linear var  = 174
*******************************************************************
   SDPT3: Infeasible path-following algorithms
*******************************************************************
 version  predcorr  gam  expon  scale_data
   HKM      1      0.000   1        0
it pstep dstep pinfeas dinfeas  gap      prim-obj      dual-obj    cputime
-------------------------------------------------------------------
 0|0.000|0.000|1.0e+00|4.2e+02|6.6e+07| 1.594184e+04  0.000000e+00| 0:0:00| chol  1  1
 1|1.000|0.979|4.4e-06|9.0e+00|1.4e+06| 1.669148e+04 -1.601448e+02| 0:0:00| chol  2  1
 2|1.000|0.927|2.6e-07|6.8e-01|1.2e+05| 1.608290e+04 -8.436216e+00| 0:0:00| chol  2  1
 3|0.357|0.874|1.8e-07|9.3e-02|3.2e+04| 1.680720e+04 -1.820168e+02| 0:0:00| chol  1  1
 4|1.000|1.000|7.4e-08|2.4e-03|4.5e+03| 4.227805e+03 -6.102167e+01| 0:0:00| chol  2  2
 5|0.876|0.867|2.0e-08|9.2e-04|5.6e+02| 5.172447e+02 -2.791549e+01| 0:0:00| chol  2  2
 6|0.518|1.000|2.3e-08|7.1e-05|4.4e+02| 4.125280e+02 -2.359589e+01| 0:0:00| chol  2  2
 7|1.000|0.906|6.8e-09|1.3e-05|2.2e+02| 2.114985e+02 -7.548113e+00| 0:0:00| chol  2  2
 8|1.000|1.000|1.2e-09|7.1e-07|8.4e+01| 7.866325e+01 -5.090441e+00| 0:0:00| chol  2  1
 9|1.000|1.000|1.9e-10|7.1e-08|3.3e+01| 3.104370e+01 -1.710382e+00| 0:0:00| chol  1  1
10|0.938|1.000|9.4e-11|7.1e-09|9.0e+00| 7.699920e+00 -1.290106e+00| 0:0:00| chol  1  2
11|1.000|1.000|5.0e-13|7.2e-10|3.8e+00| 2.872197e+00 -9.738772e-01| 0:0:00| chol  1  2
12|0.923|0.968|3.0e-13|9.3e-11|4.8e-01|-4.148225e-01 -8.926528e-01| 0:0:00| chol  2  2
13|0.849|0.989|2.3e-12|9.0e-12|2.2e-01|-6.408388e-01 -8.617566e-01| 0:0:00| chol  2  2
14|1.000|1.000|7.5e-12|1.7e-12|1.0e-01|-7.538275e-01 -8.553031e-01| 0:0:00| chol  2  2
15|0.963|0.981|7.9e-12|1.6e-12|1.8e-02|-8.302557e-01 -8.483008e-01| 0:0:00| chol  2  2
16|1.000|1.000|2.4e-11|1.6e-12|5.5e-03|-8.419747e-01 -8.474973e-01| 0:0:00| chol  2  2
17|0.998|0.860|1.0e-10|2.6e-12|4.2e-04|-8.467136e-01 -8.471297e-01| 0:0:00| chol  3  3
18|0.876|0.919|7.7e-11|3.7e-12|8.2e-05|-8.469967e-01 -8.470787e-01| 0:0:00| chol  4  4
19|0.995|1.000|3.1e-10|5.3e-12|1.7e-05|-8.470564e-01 -8.470738e-01| 0:0:00| chol  5  5
20|1.000|0.996|6.3e-11|8.0e-12|2.4e-07|-8.470727e-01 -8.470729e-01| 0:0:00|
  stop: max(relative gap, infeasibilities) < 1.00e-07
-------------------------------------------------------------------
 number of iterations   = 20
 primal objective value = -8.47072705e-01
 dual   objective value = -8.47072910e-01
 gap := trace(XZ)       = 2.36e-07
 relative gap           = 8.75e-08
 actual relative gap    = 7.59e-08
 rel. primal infeas     = 6.27e-11
 rel. dual   infeas     = 7.97e-12
 norm(X), norm(y), norm(Z) = 2.2e+01, 6.0e+01, 4.4e+01
 norm(A), norm(b), norm(C) = 4.4e+03, 2.2e+03, 4.6e+01
 Total CPU time (secs)  = 0.12
 CPU time per iteration = 0.01
 termination code       =  0
 DIMACS errors: 1.2e-10  0.0e+00  1.1e-11  0.0e+00  7.6e-08  8.8e-08
-------------------------------------------------------------------

ans =
```

```
    0.8471

Iteration   2   Total error is: 0.018633

 num. of constraints = 33
 dim. of socp   var  = 34,   num. of socp blk  =  1
 dim. of linear var  = 174
*******************************************************************
   SDPT3: Infeasible path-following algorithms
*******************************************************************
 version  predcorr  gam  expon  scale_data
   HKM      1      0.000   1        0
it pstep dstep pinfeas dinfeas  gap      prim-obj      dual-obj    cputime
-------------------------------------------------------------------
 0|0.000|0.000|1.0e+00|4.2e+02|6.7e+07| 1.623258e+04  0.000000e+00| 0:0:00| chol  1  1
 1|1.000|0.979|4.6e-06|9.0e+00|1.4e+06| 1.698154e+04 -1.735366e+02| 0:0:00| chol  2  2
 2|1.000|0.926|2.6e-07|6.9e-01|1.2e+05| 1.636100e+04 -9.529969e+00| 0:0:00| chol  2  1
 3|0.360|0.873|1.9e-07|9.4e-02|3.3e+04| 1.710968e+04 -1.861764e+02| 0:0:00| chol  2  1
 4|1.000|1.000|7.3e-08|2.4e-03|4.5e+03| 4.220490e+03 -6.240956e+01| 0:0:00| chol  2  2
 5|0.866|0.856|2.0e-08|9.4e-04|6.0e+02| 5.631670e+02 -2.886114e+01| 0:0:00| chol  2  2
 6|0.523|1.000|2.2e-08|7.1e-05|4.7e+02| 4.467305e+02 -2.520886e+01| 0:0:00| chol  2  1
 7|1.000|0.909|7.4e-09|1.3e-05|2.3e+02| 2.259944e+02 -8.102281e+00| 0:0:00| chol  2  2
 8|1.000|1.000|1.2e-09|7.1e-07|9.0e+01| 8.454842e+01 -5.508396e+00| 0:0:00| chol  2  2
 9|1.000|1.000|2.1e-10|7.1e-08|3.6e+01| 3.408725e+01 -1.753330e+00| 0:0:00| chol  1  1
10|0.936|1.000|6.2e-11|7.1e-09|1.0e+01| 8.657728e+00 -1.310193e+00| 0:0:00| chol  1  1
11|1.000|1.000|7.5e-12|7.2e-10|4.3e+00| 3.338679e+00 -9.470588e-01| 0:0:00| chol  1  1
12|0.923|0.969|1.4e-11|9.2e-11|5.3e-01|-3.220173e-01 -8.566365e-01| 0:0:00| chol  2  2
13|0.859|1.000|2.8e-12|9.3e-12|2.4e-01|-5.887605e-01 -8.281344e-01| 0:0:00| chol  2  2
14|1.000|1.000|1.3e-11|1.7e-12|1.1e-01|-7.072351e-01 -8.209991e-01| 0:0:00| chol  2  2
15|0.987|1.000|2.5e-12|1.6e-12|2.6e-02|-7.879516e-01 -8.140934e-01| 0:0:00| chol  2  2
16|1.000|1.000|5.0e-12|1.0e-12|6.0e-03|-8.062283e-01 -8.122780e-01| 0:0:00| chol  2  2
17|0.983|0.840|1.8e-11|1.2e-12|6.8e-04|-8.112100e-01 -8.118884e-01| 0:0:00| chol  3  3
18|0.877|0.922|1.4e-10|1.6e-12|1.7e-04|-8.116649e-01 -8.118355e-01| 0:0:00| chol  3  4
19|1.000|0.991|2.0e-10|2.3e-12|2.0e-05|-8.118016e-01 -8.118219e-01| 0:0:00| chol  8  9
20|1.000|1.000|6.3e-10|3.4e-12|4.5e-06|-8.118157e-01 -8.118209e-01| 0:0:00| chol  8  8
21|1.000|1.000|6.0e-10|5.1e-12|7.7e-08|-8.118206e-01 -8.118207e-01| 0:0:00|
  stop: max(relative gap, infeasibilities) < 1.00e-07
-------------------------------------------------------------------
 number of iterations   = 21
 primal objective value = -8.11820567e-01
 dual   objective value = -8.11820669e-01
 gap := trace(XZ)       = 7.69e-08
 relative gap           = 2.93e-08
 actual relative gap    = 3.86e-08
 rel. primal infeas     = 6.05e-10
 rel. dual   infeas     = 5.06e-12
 norm(X), norm(y), norm(Z) = 2.1e+01, 6.0e+01, 4.3e+01
 norm(A), norm(b), norm(C) = 4.5e+03, 2.2e+03, 4.6e+01
 Total CPU time (secs)  = 0.13
 CPU time per iteration = 0.01
 termination code       =  0
 DIMACS errors: 1.1e-09  0.0e+00  7.1e-12  0.0e+00  3.9e-08  2.9e-08
-------------------------------------------------------------------
```

```
ans =

    0.8118

Iteration   3   Total error is: 0.018223

 num. of constraints = 33
 dim. of socp   var  = 34,   num. of socp blk  =  1
 dim. of linear var  = 174
*******************************************************************
   SDPT3: Infeasible path-following algorithms
*******************************************************************
 version  predcorr  gam  expon  scale_data
   HKM      1      0.000   1        0
it pstep dstep pinfeas dinfeas  gap      prim-obj      dual-obj    cputime
-------------------------------------------------------------------
 0|0.000|0.000|1.0e+00|4.2e+02|6.8e+07| 1.657045e+04  0.000000e+00| 0:0:00| chol  1  1
 1|1.000|0.979|4.6e-06|9.0e+00|1.5e+06| 1.731940e+04 -1.855290e+02| 0:0:00| chol  2  1
 2|1.000|0.926|2.6e-07|6.9e-01|1.2e+05| 1.668632e+04 -1.043974e+01| 0:0:00| chol  2  2
 3|0.361|0.872|1.8e-07|9.5e-02|3.4e+04| 1.746438e+04 -1.910992e+02| 0:0:00| chol  2  2
 4|1.000|1.000|6.7e-08|2.4e-03|4.5e+03| 4.240779e+03 -6.388385e+01| 0:0:00| chol  1  2
 5|0.856|0.846|2.0e-08|9.6e-04|6.5e+02| 6.102288e+02 -2.985025e+01| 0:0:00| chol  2  2
 6|0.530|1.000|2.2e-08|7.1e-05|5.1e+02| 4.813352e+02 -2.684341e+01| 0:0:00| chol  2  2
 7|1.000|0.914|7.8e-09|1.3e-05|2.5e+02| 2.406155e+02 -8.668280e+00| 0:0:00| chol  2  2
 8|1.000|1.000|1.3e-09|7.1e-07|9.6e+01| 9.018941e+01 -5.951049e+00| 0:0:00| chol  2  1
 9|1.000|1.000|9.8e-11|7.1e-08|3.9e+01| 3.719665e+01 -1.814043e+00| 0:0:00| chol  1  1
10|0.934|1.000|3.8e-11|7.1e-09|1.1e+01| 9.583606e+00 -1.348167e+00| 0:0:00| chol  1  2
11|1.000|1.000|8.3e-13|7.1e-10|4.7e+00| 3.787817e+00 -9.381483e-01| 0:0:00| chol  1  1
12|0.922|0.973|4.4e-12|8.9e-11|6.0e-01|-2.364378e-01 -8.393577e-01| 0:0:00| chol  2  2
13|0.884|1.000|2.8e-12|8.1e-12|2.6e-01|-5.507118e-01 -8.099306e-01| 0:0:00| chol  2  2
14|1.000|1.000|5.1e-12|1.7e-12|1.1e-01|-6.874609e-01 -8.007542e-01| 0:0:00| chol  2  2
15|1.000|1.000|6.1e-12|1.1e-12|3.2e-02|-7.627377e-01 -7.949191e-01| 0:0:00| chol  2  2
16|1.000|0.993|1.1e-11|1.2e-12|5.2e-03|-7.871207e-01 -7.922866e-01| 0:0:00| chol  2  2
17|0.964|0.878|1.1e-11|2.0e-12|9.3e-04|-7.910638e-01 -7.919896e-01| 0:0:00| chol  3  3
18|0.738|0.956|1.5e-10|2.3e-12|3.6e-04|-7.915875e-01 -7.919448e-01| 0:0:00| chol  3  3
19|0.935|0.981|4.8e-10|3.4e-12|2.8e-05|-7.919003e-01 -7.919285e-01| 0:0:00| chol  7  7
20|1.000|1.000|2.0e-09|5.0e-12|7.1e-06|-7.919220e-01 -7.919281e-01| 0:0:00| chol 11 10
21|1.000|1.000|5.0e-10|7.5e-12|1.4e-07|-7.919278e-01 -7.919278e-01| 0:0:00|
  stop: max(relative gap, infeasibilities) < 1.00e-07
-------------------------------------------------------------------
 number of iterations   = 21
 primal objective value = -7.91927842e-01
 dual   objective value = -7.91927824e-01
 gap := trace(XZ)       = 1.36e-07
 relative gap           = 5.27e-08
 actual relative gap    = -6.96e-09
 rel. primal infeas     = 4.98e-10
 rel. dual   infeas     = 7.51e-12
 norm(X), norm(y), norm(Z) = 2.1e+01, 6.0e+01, 4.3e+01
 norm(A), norm(b), norm(C) = 4.6e+03, 2.2e+03, 4.6e+01
 Total CPU time (secs)  = 0.16
 CPU time per iteration = 0.01
 termination code       =  0
 DIMACS errors: 9.4e-10  0.0e+00  1.1e-11  0.0e+00  -7.0e-09  5.3e-08
-------------------------------------------------------------------
```

```
ans =

    0.7919

Iteration   4   Total error is: 0.017983

 num. of constraints = 33
 dim. of socp   var  = 34,   num. of socp blk  =  1
 dim. of linear var  = 174
*******************************************************************
   SDPT3: Infeasible path-following algorithms
*******************************************************************
 version  predcorr  gam  expon  scale_data
   HKM      1      0.000   1        0
it pstep dstep pinfeas dinfeas  gap      prim-obj      dual-obj    cputime
-------------------------------------------------------------------
 0|0.000|0.000|1.0e+00|4.2e+02|6.9e+07| 1.682852e+04  0.000000e+00| 0:0:00| chol  1  1
 1|1.000|0.979|4.7e-06|9.0e+00|1.5e+06| 1.757736e+04 -1.916933e+02| 0:0:00| chol  2  1
 2|1.000|0.925|2.5e-07|6.9e-01|1.3e+05| 1.693551e+04 -1.096236e+01| 0:0:00| chol  2  2
 3|0.361|0.871|1.8e-07|9.6e-02|3.5e+04| 1.773741e+04 -1.951107e+02| 0:0:00| chol  2  2
 4|1.000|1.000|6.5e-08|2.4e-03|4.5e+03| 4.270314e+03 -6.510048e+01| 0:0:00| chol  2  2
 5|0.850|0.840|2.0e-08|9.7e-04|6.9e+02| 6.446517e+02 -3.066507e+01| 0:0:00| chol  2  2
 6|0.534|1.000|2.3e-08|7.1e-05|5.4e+02| 5.068134e+02 -2.808865e+01| 0:0:00| chol  2  1
 7|1.000|0.917|8.2e-09|1.2e-05|2.6e+02| 2.517730e+02 -9.098646e+00| 0:0:00| chol  2  2
 8|1.000|1.000|1.3e-09|7.1e-07|1.0e+02| 9.436588e+01 -6.299124e+00| 0:0:00| chol  1  2
 9|1.000|1.000|2.5e-10|7.1e-08|4.1e+01| 3.956221e+01 -1.867521e+00| 0:0:00| chol  1  1
10|0.933|1.000|1.1e-11|7.1e-09|1.2e+01| 1.025197e+01 -1.382770e+00| 0:0:00| chol  1  1
11|1.000|1.000|4.4e-12|7.1e-10|5.1e+00| 4.111234e+00 -9.387980e-01| 0:0:00| chol  1  2
12|0.921|0.976|5.0e-13|8.7e-11|6.6e-01|-1.730632e-01 -8.348931e-01| 0:0:00| chol  2  2
13|0.915|1.000|2.7e-12|8.1e-12|2.7e-01|-5.303795e-01 -8.051806e-01| 0:0:00| chol  2  2
14|1.000|1.000|7.6e-12|1.7e-12|1.1e-01|-6.803106e-01 -7.943664e-01| 0:0:00| chol  2  2
15|0.991|1.000|3.2e-12|1.6e-12|3.7e-02|-7.517642e-01 -7.890920e-01| 0:0:00| chol  2  2
16|1.000|0.999|1.6e-11|1.0e-12|6.1e-03|-7.799322e-01 -7.860314e-01| 0:0:00| chol  2  2
17|0.980|0.849|6.4e-11|1.7e-12|9.0e-04|-7.847777e-01 -7.856798e-01| 0:0:00| chol  3  3
18|0.739|0.952|1.5e-10|2.3e-12|3.5e-04|-7.852795e-01 -7.856275e-01| 0:0:00| chol  3  3
19|0.952|0.976|2.9e-10|3.4e-12|2.0e-05|-7.855881e-01 -7.856084e-01| 0:0:00| chol  7  7
20|1.000|1.000|1.3e-09|5.1e-12|6.2e-06|-7.856029e-01 -7.856080e-01| 0:0:00| chol 14 15
21|1.000|1.000|1.5e-09|7.6e-12|1.0e-06|-7.856063e-01 -7.856078e-01| 0:0:00| chol
  linsysolve: Schur complement matrix not positive definite
  switch to LU factor. lu 30  30
22|0.938|0.773|2.7e-09|1.3e-11|8.5e-08|-7.856074e-01 -7.856077e-01| 0:0:00|
  stop: max(relative gap, infeasibilities) < 1.00e-07
-------------------------------------------------------------------
 number of iterations   = 22
 primal objective value = -7.85607422e-01
 dual   objective value = -7.85607720e-01
 gap := trace(XZ)       = 8.51e-08
 relative gap           = 3.31e-08
 actual relative gap    = 1.16e-07
 rel. primal infeas     = 2.67e-09
 rel. dual   infeas     = 1.31e-11
 norm(X), norm(y), norm(Z) = 2.1e+01, 6.0e+01, 4.3e+01
 norm(A), norm(b), norm(C) = 4.6e+03, 2.2e+03, 4.6e+01
 Total CPU time (secs)  = 0.13
```

```
 CPU time per iteration = 0.01
 termination code       =  0
 DIMACS errors: 5.0e-09  0.0e+00  1.8e-11  0.0e+00  1.2e-07  3.3e-08
------------------------------------------------------------------

ans =

    0.7856

Iteration   5   Total error is: 0.017903

 num. of constraints = 33
 dim. of socp   var  = 34,   num. of socp blk  =  1
 dim. of linear var  = 174
*******************************************************************
   SDPT3: Infeasible path-following algorithms
*******************************************************************
 version  predcorr  gam  expon  scale_data
   HKM      1      0.000   1        0
it pstep dstep pinfeas dinfeas  gap      prim-obj      dual-obj    cputime
-------------------------------------------------------------------
 0|0.000|0.000|1.0e+00|4.2e+02|7.0e+07| 1.703702e+04  0.000000e+00| 0:0:00| chol  1  1
 1|1.000|0.979|4.7e-06|9.0e+00|1.5e+06| 1.778623e+04 -1.977080e+02| 0:0:00| chol  2  2
 2|1.000|0.925|2.5e-07|6.9e-01|1.3e+05| 1.713646e+04 -1.133793e+01| 0:0:00| chol  2  1
 3|0.361|0.870|1.8e-07|9.7e-02|3.5e+04| 1.795557e+04 -1.981461e+02| 0:0:00| chol  2  2
 4|1.000|1.000|6.3e-08|2.4e-03|4.5e+03| 4.278747e+03 -6.596411e+01| 0:0:00| chol  2  2
 5|0.844|0.833|2.0e-08|9.8e-04|7.2e+02| 6.753019e+02 -3.128958e+01| 0:0:00| chol  2  2
 6|0.540|1.000|2.2e-08|7.1e-05|5.6e+02| 5.288011e+02 -2.905009e+01| 0:0:00| chol  2  2
 7|1.000|0.921|8.5e-09|1.2e-05|2.7e+02| 2.609122e+02 -9.436849e+00| 0:0:00| chol  1  2
 8|1.000|1.000|1.3e-09|7.1e-07|1.0e+02| 9.777117e+01 -6.591419e+00| 0:0:00| chol  2  2
 9|1.000|1.000|2.5e-10|7.1e-08|4.4e+01| 4.160399e+01 -1.908864e+00| 0:0:00| chol  1  1
10|0.933|1.000|1.1e-10|7.1e-09|1.2e+01| 1.079957e+01 -1.406548e+00| 0:0:00| chol  1  2
11|1.000|1.000|6.2e-13|7.3e-10|5.3e+00| 4.374773e+00 -9.360896e-01| 0:0:00| chol  1  1
12|0.920|0.978|4.2e-12|8.6e-11|7.1e-01|-1.205491e-01 -8.288112e-01| 0:0:00| chol  2  2
13|0.928|1.000|3.1e-12|8.1e-12|2.9e-01|-5.081760e-01 -7.990113e-01| 0:0:00| chol  2  2
14|1.000|1.000|1.1e-12|1.7e-12|1.2e-01|-6.674186e-01 -7.872444e-01| 0:0:00| chol  2  2
15|0.975|1.000|1.9e-12|1.1e-12|4.0e-02|-7.416448e-01 -7.817784e-01| 0:0:00| chol  2  2
16|1.000|1.000|3.7e-12|1.0e-12|6.9e-03|-7.717708e-01 -7.786437e-01| 0:0:00| chol  2  2
17|0.988|0.861|2.2e-11|1.1e-12|9.8e-04|-7.772477e-01 -7.782232e-01| 0:0:00| chol  3  3
18|0.719|0.945|1.7e-10|1.6e-12|4.2e-04|-7.777486e-01 -7.781708e-01| 0:0:00| chol  3  3
19|0.979|0.975|1.5e-10|2.3e-12|1.9e-05|-7.781268e-01 -7.781457e-01| 0:0:00| chol  5  6
20|1.000|1.000|5.1e-10|3.4e-12|1.4e-06|-7.781432e-01 -7.781446e-01| 0:0:00| chol
  linsysolve: Schur complement matrix not positive definite
  switch to LU factor. lu 14 ^16
21|0.992|0.855|4.5e-10|5.6e-12|3.5e-08|-7.781442e-01 -7.781446e-01| 0:0:00|
  stop: max(relative gap, infeasibilities) < 1.00e-07
-------------------------------------------------------------------
 number of iterations   = 21
 primal objective value = -7.78144224e-01
 dual   objective value = -7.78144587e-01
 gap := trace(XZ)       = 3.49e-08
 relative gap           = 1.36e-08
 actual relative gap    = 1.42e-07
 rel. primal infeas     = 4.53e-10
 rel. dual   infeas     = 5.55e-12
```

```
 norm(X), norm(y), norm(Z) = 2.2e+01, 6.0e+01, 4.4e+01
 norm(A), norm(b), norm(C) = 4.7e+03, 2.3e+03, 4.6e+01
 Total CPU time (secs)  = 0.13
 CPU time per iteration = 0.01
 termination code       =  0
 DIMACS errors: 8.5e-10  0.0e+00  7.8e-12  0.0e+00  1.4e-07  1.4e-08
------------------------------------------------------------------

ans =

    0.7781

Iteration   6   Total error is: 0.017808

 num. of constraints = 33
 dim. of socp   var  = 34,   num. of socp blk  =  1
 dim. of linear var  = 174
*******************************************************************
   SDPT3: Infeasible path-following algorithms
*******************************************************************
 version  predcorr  gam  expon  scale_data
   HKM      1      0.000   1        0
it pstep dstep pinfeas dinfeas  gap      prim-obj      dual-obj    cputime
------------------------------------------------------------------
 0|0.000|0.000|1.0e+00|4.2e+02|7.1e+07| 1.719129e+04  0.000000e+00| 0:0:00| chol  1  1
 1|1.000|0.979|4.8e-06|9.0e+00|1.5e+06| 1.794079e+04 -2.020100e+02| 0:0:00| chol  1  1
 2|1.000|0.925|2.5e-07|7.0e-01|1.3e+05| 1.728517e+04 -1.160690e+01| 0:0:00| chol  2  2
 3|0.362|0.870|1.8e-07|9.7e-02|3.6e+04| 1.811699e+04 -2.003825e+02| 0:0:00| chol  2  1
 4|1.000|1.000|6.0e-08|2.4e-03|4.5e+03| 4.286647e+03 -6.661381e+01| 0:0:00| chol  1  2
 5|0.839|0.829|2.1e-08|9.9e-04|7.4e+02| 6.979884e+02 -3.175628e+01| 0:0:00| chol  2  1
 6|0.544|1.000|2.0e-08|7.1e-05|5.8e+02| 5.448702e+02 -2.973946e+01| 0:0:00| chol  2  2
 7|1.000|0.924|8.6e-09|1.2e-05|2.8e+02| 2.675523e+02 -9.679776e+00| 0:0:00| chol  1  2
 8|1.000|1.000|1.3e-09|7.1e-07|1.1e+02| 1.001993e+02 -6.806737e+00| 0:0:00| chol  2  2
 9|1.000|1.000|2.6e-10|7.1e-08|4.5e+01| 4.310255e+01 -1.940817e+00| 0:0:00| chol  1  1
10|0.933|1.000|1.3e-10|7.1e-09|1.3e+01| 1.118239e+01 -1.423566e+00| 0:0:00| chol  1  2
11|1.000|1.000|3.4e-13|7.3e-10|5.5e+00| 4.555506e+00 -9.352911e-01| 0:0:00| chol  1  1
12|0.919|0.980|1.6e-12|8.5e-11|7.4e-01|-8.819607e-02 -8.258160e-01| 0:0:00| chol  2  2
13|0.930|1.000|3.2e-12|8.1e-12|3.0e-01|-4.934166e-01 -7.961352e-01| 0:0:00| chol  2  2
14|1.000|1.000|2.3e-12|1.7e-12|1.3e-01|-6.574593e-01 -7.840503e-01| 0:0:00| chol  2  2
15|0.970|1.000|1.9e-12|1.1e-12|4.2e-02|-7.366755e-01 -7.782938e-01| 0:0:00| chol  2  2
16|1.000|1.000|3.2e-12|1.0e-12|7.9e-03|-7.672732e-01 -7.752078e-01| 0:0:00| chol  2  2
17|0.968|0.878|1.7e-11|1.1e-12|1.2e-03|-7.734939e-01 -7.746799e-01| 0:0:00| chol  3  3
18|0.756|0.939|1.7e-10|1.6e-12|5.0e-04|-7.741319e-01 -7.746318e-01| 0:0:00| chol  3  3
19|0.977|0.974|3.5e-10|2.3e-12|2.7e-05|-7.745722e-01 -7.745990e-01| 0:0:00| chol  5  4
20|1.000|1.000|3.0e-10|3.4e-12|4.0e-06|-7.745937e-01 -7.745976e-01| 0:0:00| chol 15 26
21|1.000|1.000|1.6e-10|5.1e-12|5.5e-08|-7.745974e-01 -7.745974e-01| 0:0:00|
  stop: max(relative gap, infeasibilities) < 1.00e-07
------------------------------------------------------------------
 number of iterations   = 21
 primal objective value = -7.74597433e-01
 dual   objective value = -7.74597448e-01
 gap := trace(XZ)       = 5.47e-08
 relative gap           = 2.15e-08
 actual relative gap    = 6.12e-09
 rel. primal infeas     = 1.64e-10
```

```
 rel. dual   infeas     = 5.06e-12
 norm(X), norm(y), norm(Z) = 2.2e+01, 6.0e+01, 4.4e+01
 norm(A), norm(b), norm(C) = 4.7e+03, 2.3e+03, 4.6e+01
 Total CPU time (secs)  = 0.14
 CPU time per iteration = 0.01
 termination code       =  0
 DIMACS errors: 3.1e-10  0.0e+00  7.1e-12  0.0e+00  6.1e-09  2.1e-08
------------------------------------------------------------------

ans =

    0.7746

Iteration   7   Total error is: 0.017761

 num. of constraints = 33
 dim. of socp   var  = 34,   num. of socp blk  =  1
 dim. of linear var  = 174
*******************************************************************
   SDPT3: Infeasible path-following algorithms
*******************************************************************
 version  predcorr  gam  expon  scale_data
   HKM      1      0.000   1        0
it pstep dstep pinfeas dinfeas  gap      prim-obj      dual-obj    cputime
------------------------------------------------------------------
 0|0.000|0.000|1.0e+00|4.2e+02|7.1e+07| 1.730190e+04  0.000000e+00| 0:0:00| chol  1  1
 1|1.000|0.979|4.8e-06|9.0e+00|1.5e+06| 1.805160e+04 -2.049872e+02| 0:0:00| chol  2  2
 2|1.000|0.925|2.4e-07|7.0e-01|1.3e+05| 1.739182e+04 -1.179418e+01| 0:0:00| chol  2  1
 3|0.362|0.870|1.8e-07|9.8e-02|3.6e+04| 1.823276e+04 -2.019939e+02| 0:0:00| chol  2  2
 4|1.000|1.000|6.1e-08|2.4e-03|4.5e+03| 4.293104e+03 -6.708904e+01| 0:0:00| chol  2  2
 5|0.836|0.826|2.0e-08|9.9e-04|7.6e+02| 7.142336e+02 -3.209847e+01| 0:0:00| chol  2  2
 6|0.547|1.000|2.2e-08|7.1e-05|5.9e+02| 5.563394e+02 -3.023453e+01| 0:0:00| chol  2  2
 7|1.000|0.926|8.8e-09|1.2e-05|2.8e+02| 2.723215e+02 -9.853978e+00| 0:0:00| chol  2  2
 8|1.000|1.000|1.3e-09|7.1e-07|1.1e+02| 1.019224e+02 -6.962534e+00| 0:0:00| chol  2  2
 9|1.000|1.000|2.6e-10|7.1e-08|4.6e+01| 4.418132e+01 -1.964963e+00| 0:0:00| chol  1  1
10|0.934|1.000|1.7e-10|7.1e-09|1.3e+01| 1.144889e+01 -1.435591e+00| 0:0:00| chol  1  1
11|1.000|1.000|5.5e-12|7.4e-10|5.6e+00| 4.679424e+00 -9.352656e-01| 0:0:00| chol  1  1
12|0.920|0.981|1.2e-11|8.4e-11|7.6e-01|-6.811739e-02 -8.242755e-01| 0:0:00| chol  2  2
13|0.929|1.000|3.2e-12|8.7e-12|3.1e-01|-4.844127e-01 -7.947542e-01| 0:0:00| chol  2  2
14|1.000|1.000|2.7e-12|1.7e-12|1.3e-01|-6.507748e-01 -7.826069e-01| 0:0:00| chol  2  2
15|0.965|1.000|1.3e-12|1.1e-12|4.3e-02|-7.338307e-01 -7.766770e-01| 0:0:00| chol  2  2
16|1.000|1.000|5.6e-12|1.0e-12|1.0e-02|-7.636277e-01 -7.737962e-01| 0:0:00| chol  2  2
17|0.972|0.930|3.0e-11|1.2e-12|1.5e-03|-7.715014e-01 -7.730441e-01| 0:0:00| chol  3  3
18|0.771|0.938|1.8e-10|1.8e-12|6.3e-04|-7.723653e-01 -7.729991e-01| 0:0:00| chol  3  3
19|0.980|0.963|2.3e-10|2.6e-12|4.1e-05|-7.729171e-01 -7.729581e-01| 0:0:00| chol  4  4
20|1.000|0.992|1.8e-10|3.8e-12|7.2e-06|-7.729487e-01 -7.729559e-01| 0:0:00| chol
  warning: symqmr failed: 0.3
  switch to LU factor. lu 30   2
21|1.000|1.000|2.6e-09|5.7e-12|1.5e-07|-7.729547e-01 -7.729556e-01| 0:0:00|
  stop: max(relative gap, infeasibilities) < 1.00e-07
------------------------------------------------------------------
 number of iterations   = 21
 primal objective value = -7.72954655e-01
 dual   objective value = -7.72955598e-01
 gap := trace(XZ)       = 1.54e-07
```

```
 relative gap           = 6.04e-08
 actual relative gap    = 3.70e-07
 rel. primal infeas     = 2.64e-09
 rel. dual   infeas     = 5.67e-12
 norm(X), norm(y), norm(Z) = 2.2e+01, 6.0e+01, 4.4e+01
 norm(A), norm(b), norm(C) = 4.7e+03, 2.3e+03, 4.6e+01
 Total CPU time (secs)  = 0.16
 CPU time per iteration = 0.01
 termination code       =  0
 DIMACS errors: 4.9e-09  0.0e+00  7.9e-12  0.0e+00  3.7e-07  6.0e-08
------------------------------------------------------------------

ans =

    0.7730

Iteration   8   Total error is: 0.017738
The total representation error of the testing signals is: 0.089135
>>
```