Untitled

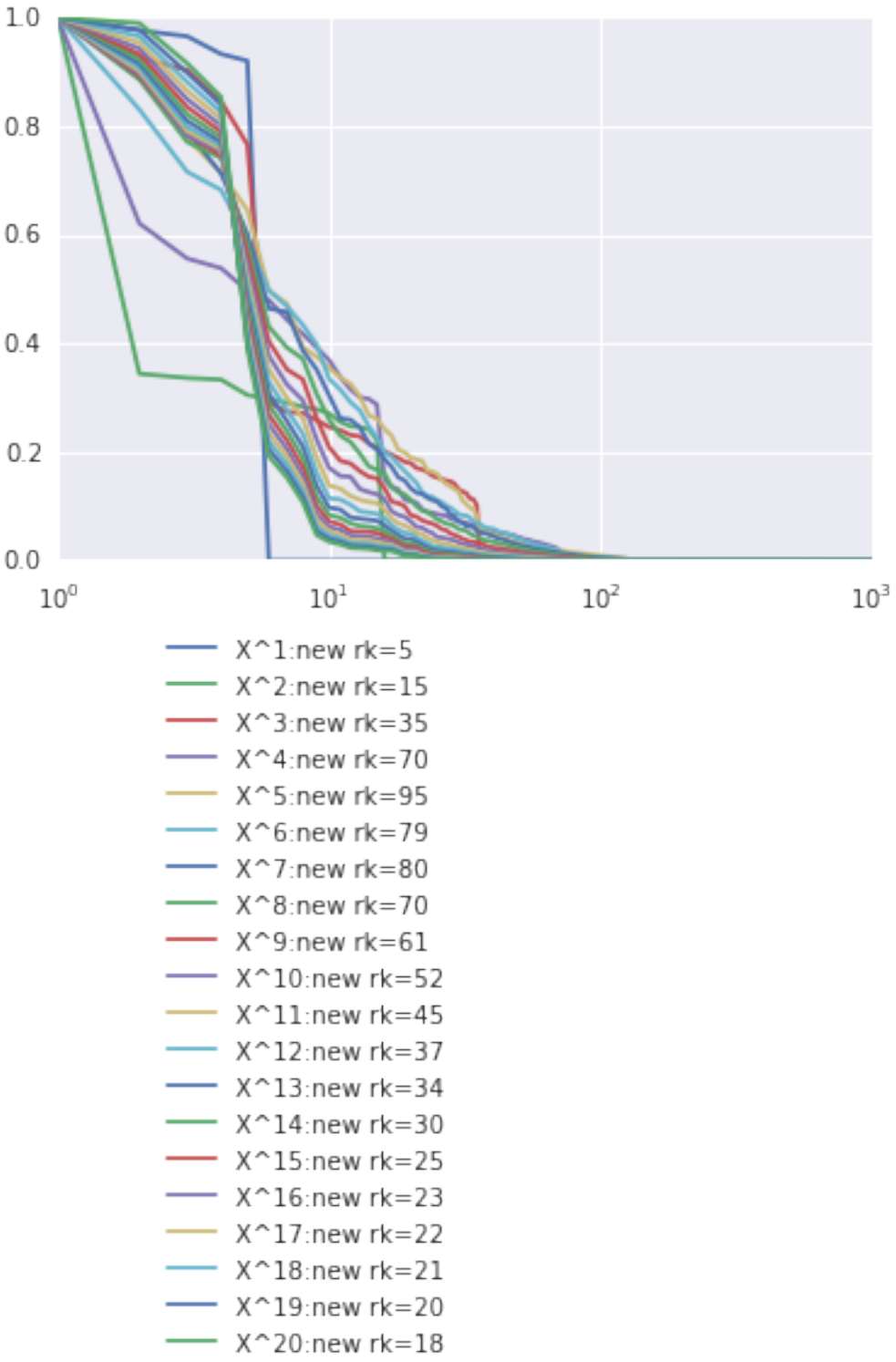
October 2, 2015

In [1]:
```
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
%matplotlib inline
```

In [3]:
```
n=1000
rk=5
U=np.random.randn(n,rk)
V=np.random.randn(n,rk)
X=U.dot(V.T)

for i in range(1,21):
    Xp=X**i
    Sp=np.linalg.svd(Xp)[1]
    s=Sp/np.max(Sp)
    r=np.nonzero(s<=1e-2)[0][0]
    plt.plot(np.arange(1,len(s)+1),s,label=('X^%d:new rk=%r' %(i,r)))
plt.xscale('log')
plt.legend(loc='upper right', bbox_to_anchor=(0.5,-0.1))
```

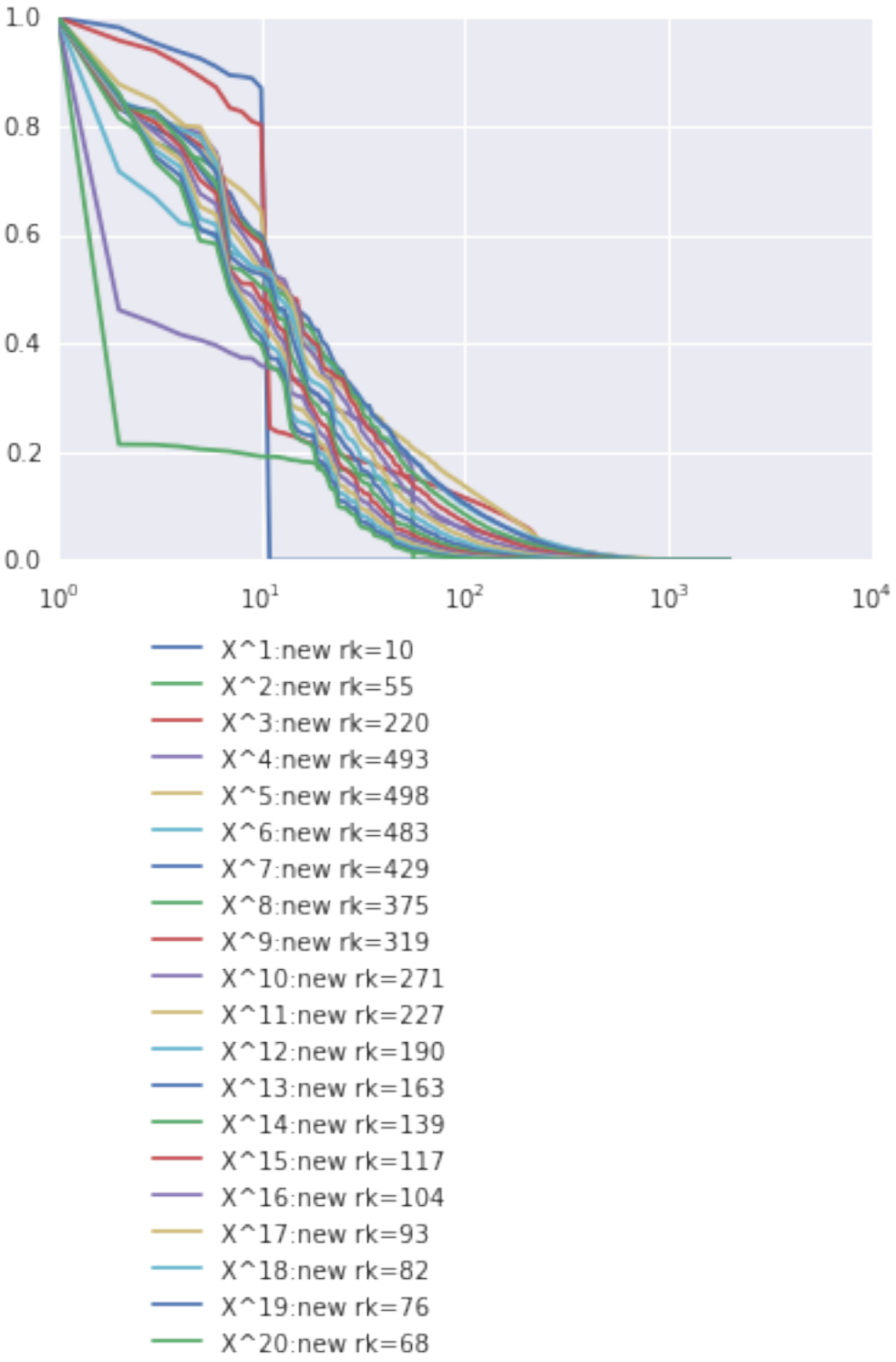
Out[3]:
```
<matplotlib.legend.Legend at 0x7f4a75b519d0>
```



In [7]:
```
n=2000
rk=10
U=np.random.randn(n,rk)
```

```
V=np.random.randn(n,rk)
X=U.dot(V.T)
#Xp=0
#plt.rc('text', usetex=True)
for i in range(1,21):
    Xp=X**i
    Sp=np.linalg.svd(Xp)[1]
    s=Sp/np.max(Sp)
    r=np.nonzero(s<=1e-2)[0][0]
    plt.plot(np.arange(1,len(s)+1),s,label=('X^%d:new rk=%r' %(i,r)))
plt.xscale('log')
plt.legend(loc='upper right', bbox_to_anchor=(0.5,-0.1))
```

Out[7]: <matplotlib.legend.Legend at 0x7f4a75cc6990>


1.0
0.8
0.6
0.4
0.2
0.0
10^0
10^1
10^2
10^3
10^4
X^1:new rk=10
X^2:new rk=55
X^3:new rk=220
X^4:new rk=493
X^5:new rk=498
X^6:new rk=483
X^7:new rk=429
X^8:new rk=375
X^9:new rk=319
X^10:new rk=271
X^11:new rk=227
X^12:new rk=190
X^13:new rk=163
X^14:new rk=139
X^15:new rk=117
X^16:new rk=104
X^17:new rk=93
X^18:new rk=82
X^19:new rk=76
X^20:new rk=68