Data - Flickr

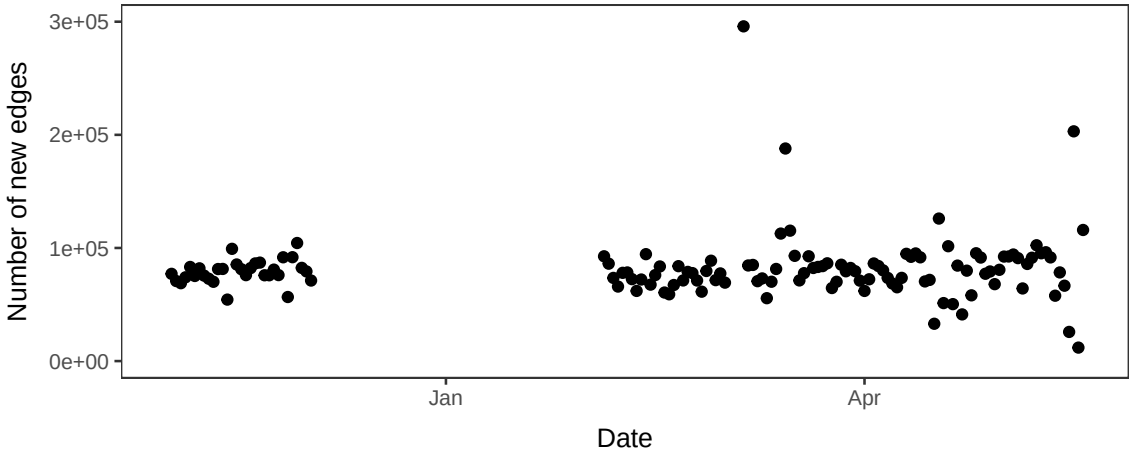
Jan Overgoor

- Source: http://socialnetworks.mpi-sws.org/data-wosn2008.html
- Paper: https://people.mpi-sws.org/~amislove/publications/Growth-WOSN.pdf

Read data

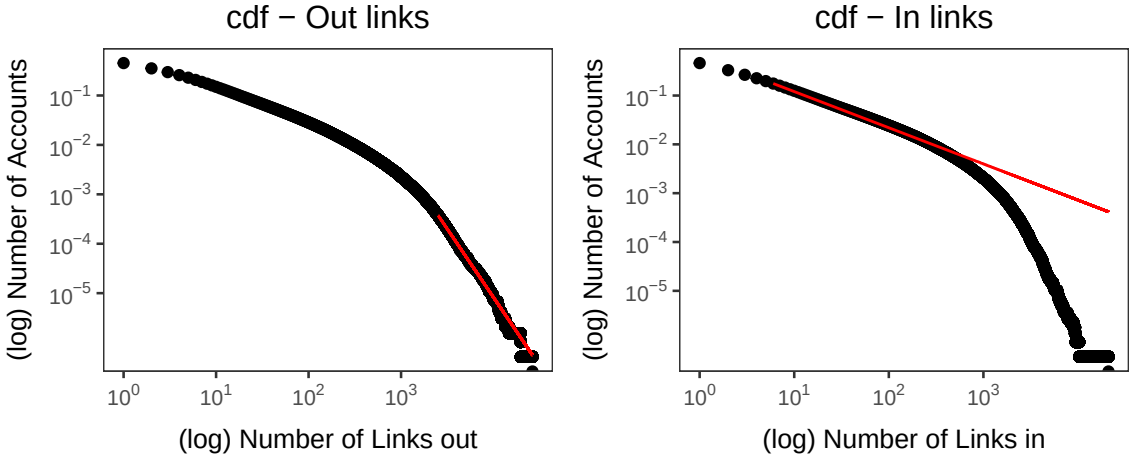
- total number of nodes: 2302925
- total number of edges: 33140018
- avg in-degree 14.3904026
- avg out-degree 14.3904026
- **why are they the same?**
  - about 60% of edges are reciprocated, so not 100%..
  - δ in/out seems reasonable in the extremes (natural limit to out, except for scammers)
  - overflow issue?

Number of connections by day



In/out degree

```
## [1] "plfit:  alpha=3.771  xmin=2516"
## [1] "plfit:  alpha=1.741  xmin=6"
```



Jackson R

- Fitted $r^* = 0.337$
- Fitted $r = \frac{r^*}{1+r^*} = 0.252$

Model results on 2016-11-05

```
##
## ================================================================================================
##                                                  y
##                      (1)          (2)          (3)          (4)          (5)          (6)
## ------------------------------------------------------------------------------------------------
## log In-Degree    1.061***                  0.513***     0.432***     0.496***     0.425***
##                   (0.007)                   (0.009)      (0.010)      (0.011)      (0.010)
##
## Reciprocal       8.702***     8.948***     8.564***     8.548***     8.779***     9.869***
##                   (0.256)      (0.270)      (0.277)      (0.286)      (0.348)      (0.420)
##
## Is FoF                        6.161***     4.605***
##                                (0.049)      (0.054)
##
## 2 Hops                                                  3.860***
##                                                          (0.078)
##
## 3 Hops                                                  -0.128*
##                                                          (0.066)
##
## 4 Hops                                                  -2.582***
##                                                          (0.090)
##
## 5 Hops                                                  -3.444***
##                                                          (0.135)
##
## 6+ Hops                                                 -4.674***
##                                                          (0.240)
##
## log Hops                                                             -9.119***
##                                                                       (0.120)
##
## log Paths                                                                          2.761***
##                                                                                     (0.040)
##
## ------------------------------------------------------------------------------------------------
## Observations     20,001       20,001       20,001       20,001       18,516       20,001
## Log Likelihood -19,035.280 -13,342.850 -11,714.450 -10,210.870 -7,050.743 -11,586.390
## ================================================================================================
## Note:                                                          *p<0.1; **p<0.05; ***p<0.01

## [1] "Train accuracy  &   0.7484 & 0.7656 & 0.8373 & 0.8401 & 0.8429 & 0.8676  \\"

## [1] "Test accuracy   &   0.763 & 0.766 & 0.849 & 0.8515 & 0.8542 & 0.8765  \\"

## [1] "Test AUC        &   0.855 & 0.855 & 0.907 & 0.903 & 0.917 & 0.925  \\"
```

Model results on 2007-03-01

```
##
## ================================================================================================
##                                                  y
##                      (1)          (2)          (3)          (4)          (5)          (6)
## ------------------------------------------------------------------------------------------------
## log In-Degree    0.944***                  0.471***     0.363***     0.430***     0.421***
##                   (0.006)                   (0.008)      (0.009)      (0.010)      (0.008)
##
## Reciprocal       9.607***     9.613***     9.285***     9.362***     9.883***    12.671***
##                   (0.337)      (0.341)      (0.345)      (0.356)      (0.472)      (0.532)
##
## Is FoF                        6.051***     4.685***
##                                (0.047)      (0.050)
##
## 2 Hops                                                  4.183***
##                                                          (0.072)
##
## 3 Hops                                                  0.212***
##                                                          (0.060)
##
## 4 Hops                                                  -2.159***
##                                                          (0.073)
##
## 5 Hops                                                  -3.604***
##                                                          (0.128)
##
## 6+ Hops                                                 -4.416***
##                                                          (0.184)
##
## log Hops                                                             -8.936***
##                                                                       (0.108)
##
## log Paths                                                                         3.192***
##                                                                                   (0.043)
##
## ------------------------------------------------------------------------------------------------
## Observations     20,000       20,000       20,000       20,000       17,565       20,000
## Log Likelihood -23,548.080 -16,511.730 -14,822.580 -12,789.410 -7,819.970 -15,116.650
## ================================================================================================
## Note:                                                              *p<0.1; **p<0.05; ***p<0.01
## [1] "Train accuracy  &   0.6916 & 0.7276 & 0.7972 & 0.8016 & 0.8138 & 0.8252  \\"
## [1] "Test accuracy   &   0.7005 & 0.722 & 0.801 & 0.8035 & 0.809 & 0.832  \\"
## [1] "Test AUC        &   0.82 & 0.834 & 0.874 & 0.877 & 0.88 & 0.899  \\"
```