IDEAL COVERT NETWORKS

Eun Kyong Shin

February 3, 2015

Issues

- Level of analysis: who gets detected more vs. which network gets detected more
- How to measure core in observed network: Freezed degree vs. non constraint degree

---

OBSERVED DATA EXAMPLE

In the following network graphic, detected people are colored in black over the PGK network of the year of 1919.

```
att<-read.csv("attributes.csv", header=T)
pgk<-read.csv("pgk1919Nodes.csv", header=T)
pgk1919<- as.matrix(read.table("pgk1919.txt"))
names(att)
```

```
##  [1] "ID"        "HOME"      "ENTER"     "EXIT"      "Executed"
##  [6] "TENURE"    "Killed"    "Arrested"  "TYPE"      "Gender"
## [11] "eventyear"
```

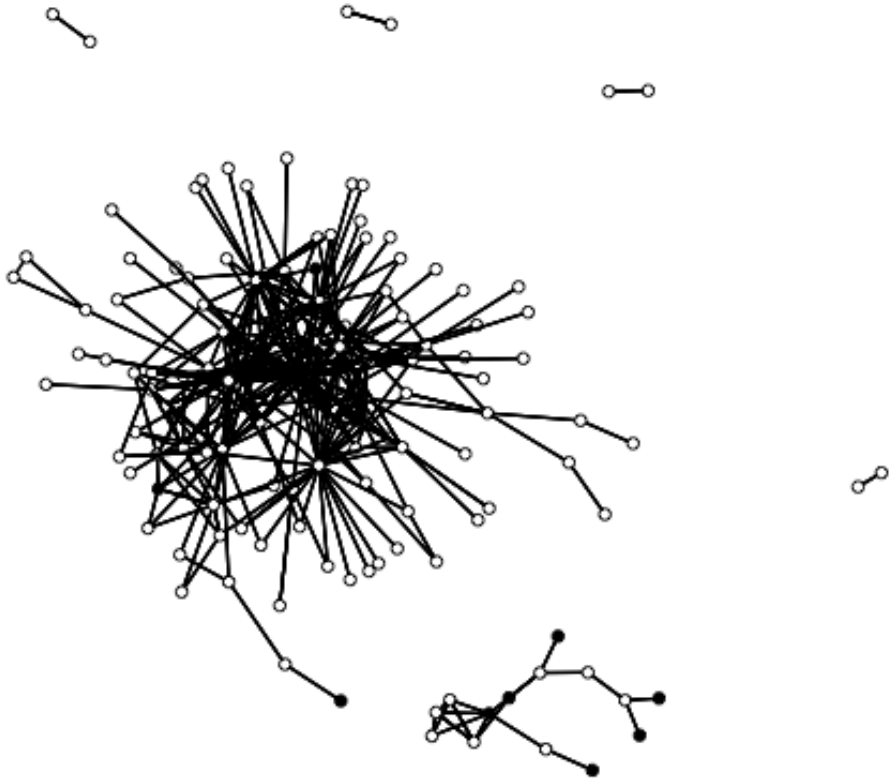
Non-structural/network varaiables in the attribute files are `HOME`, `GENTER`, `KILLED`, `ARREDTED`, `EVENTYEAR`. `HOME` variable describes member's hometwon origin and `EVENTYEAR` variable includes the time of being detected execusion. `EXECUTED` variable is calculated as dummy of the union of `KILLED` and `ARREDTED` ignoring the time of being detected.

```
p1919<-network(pgk1919, directed=F)
att$detected<-as.numeric(att$eventyear==1919)
kill<-att[,12]
gplot(p1919, displaylabels=F, arrow=F, vertex.col=kill, displayisolates=FALSE)
```

Network attributes of the PGK 1919 network are described in the following table, with 140 non-isolated nodes.

Network attributes	Value
vertices	414
directed	FALSE
hyper	FALSE
loops	FALSE
multiple	FALSE
bipartite	FALSE
density	0.00936

DETECTED PGK MEMBERS 1919



Degree distribution of the PGK 1919 network is presnted in the following graphic. As isolates are not considered, the Min. is 1 and the Max. is 34 with Mean of 5.114 and Median of 3.00.

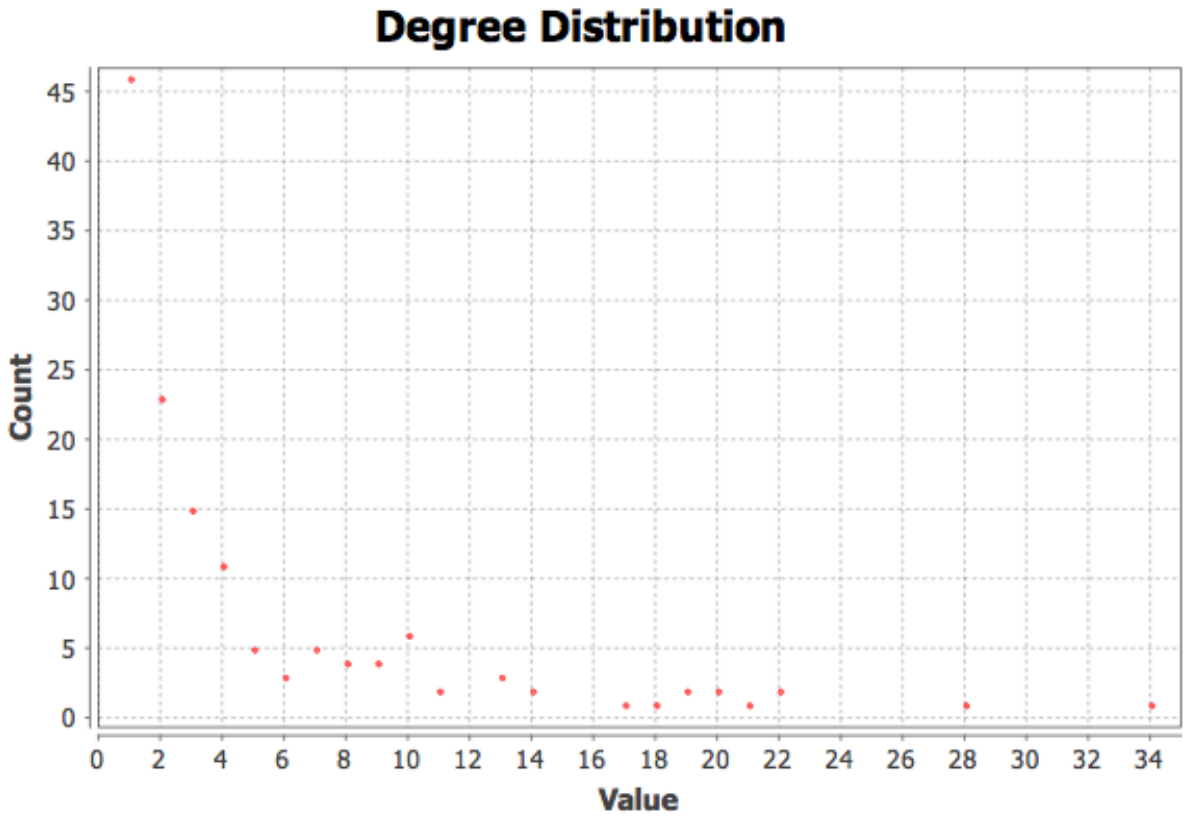


Figure 1: Degree Distribution

Killed or arrested for each year

1	eventyear	freq
2	1919	15
3	1920	24
4	1921	12
5	1922	2
6	1923	5
7	1924	2
8	1925	3

1	eventyear	freq
9	1926	3
10	1927	3
11	1928	9
12	1929	2
13	1930	6
14	1932	5
15	1933	5
16	1934	3
17	1935	8
18	1936	6
19	1937	4
20	1938	8
21	1939	1
22	1940	1
23	1941	5
24	1942	1
25	1943	5
26	1944	3
27	1945	1

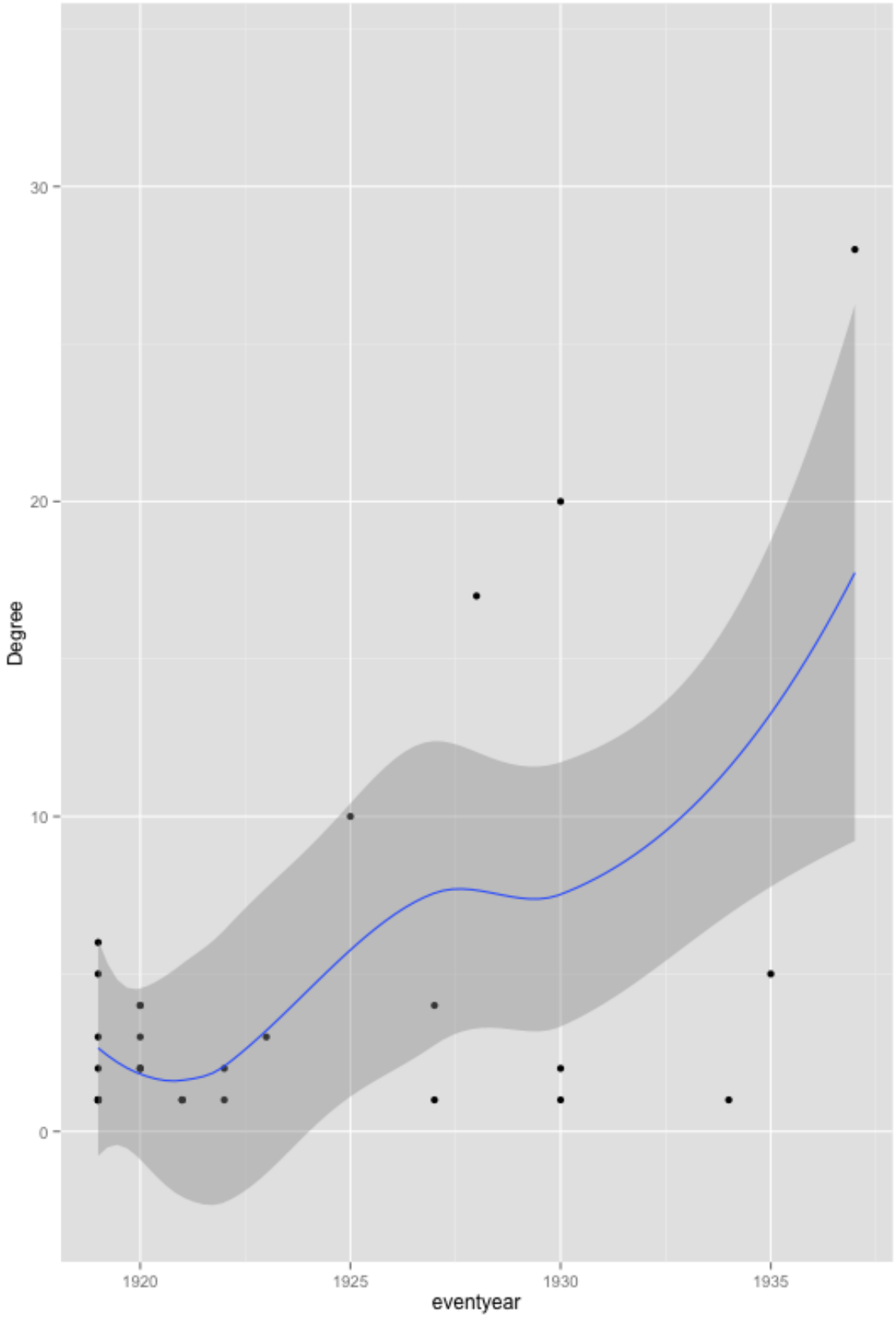


Figure 2: Degree by detection time

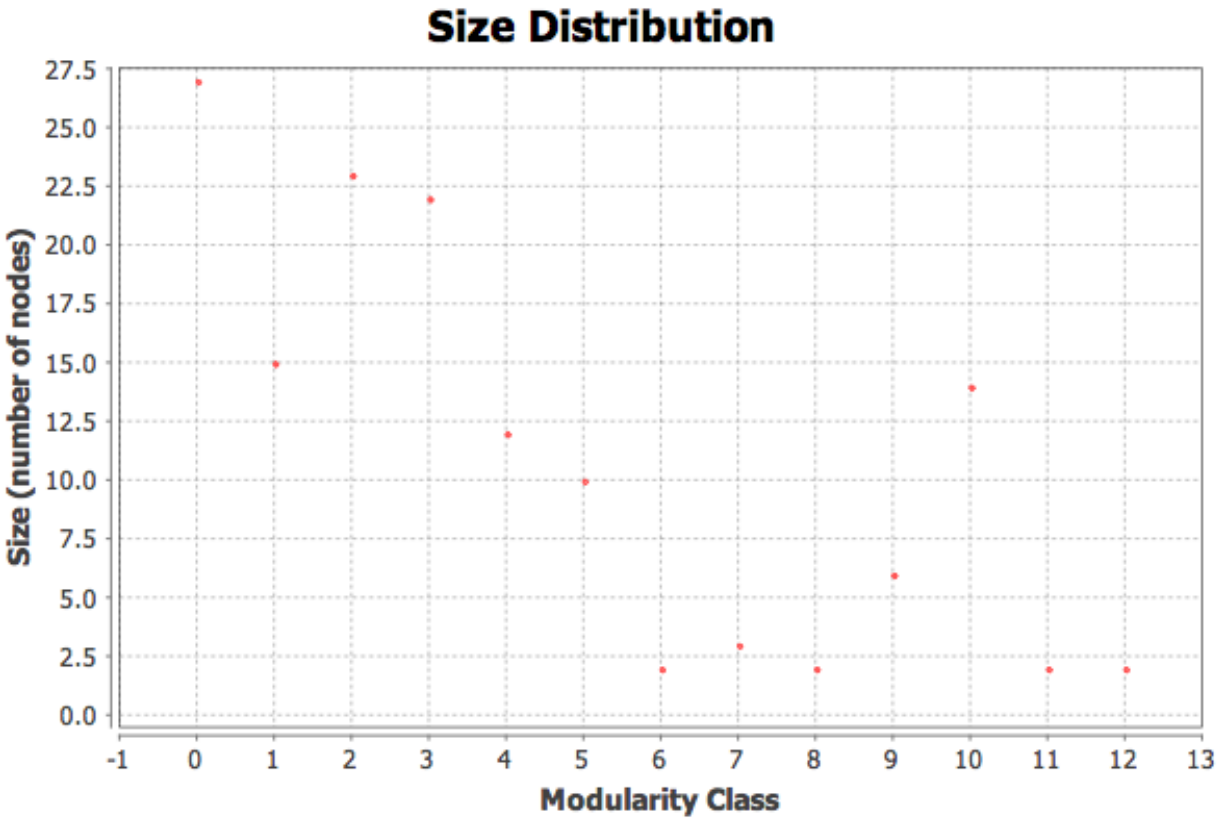


Figure 3: Modularity