Feature Extraction

degreedata.xlsx

```r
library(tidyverse)
```

```
## -- Attaching packages --------------------------------------------------------------------------

## v ggplot2 3.3.2     v purrr   0.3.4
## v tibble  3.0.3     v dplyr   1.0.3
## v tidyr   1.1.2     v stringr 1.4.0
## v readr   1.3.1     v forcats 0.5.0

## -- Conflicts --------------------------------------------------------------------------
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```r
library(readxl)
p2_degree = read_excel(path = "feature/p2-fro_degreedata.xlsx", col_names = TRUE)
p3_degree = read_excel(path = "feature/p3-fro_degreedata.xlsx", col_names = TRUE)
p4_degree = read_excel(path = "feature/p4-fro_degreedata.xlsx", col_names = TRUE)
p5_degree = read_excel(path = "feature/p5-fro_degreedata.xlsx", col_names = TRUE)
p6_degree = read_excel(path = "feature/p6-fro_degreedata.xlsx", col_names = TRUE)
p7_degree = read_excel(path = "feature/p7-fro_degreedata.xlsx", col_names = TRUE)
```

Count of branchpoints

```r
# Count of branchpoints
nrow(p2_degree)
```

```
## [1] 481
```

```r
nrow(p3_degree)
```

```
## [1] 910
```

```r
nrow(p4_degree)
```

```
## [1] 1444
```

```
nrow(p5_degree)
```

```
## [1] 2723
```

```
nrow(p6_degree)
```

```
## [1] 3238
```

```
nrow(p7_degree)
```

```
## [1] 3956
```

Spatial density of nodes (Branching number per node)

```
# Branching number per node
# Spatial density of nodes
deg_spatial_density = data.frame(miceage = c(), degree = c(), density = c())

degree = p2_degree$degree
deg_density = table(degree)[max(degree):1] %>%
  prop.table() %>%
  cumsum() %>%
  rev()
deg_spatial_density = rbind(deg_spatial_density,
                            data.frame(miceage = rep(2,max(degree)), degree = 1:max(degree), density = 

degree = p3_degree$degree
deg_density = table(degree)[max(degree):1] %>%
  prop.table() %>%
  cumsum() %>%
  rev()
deg_spatial_density = rbind(deg_spatial_density,
                            data.frame(miceage = rep(3,max(degree)), degree = 1:max(degree), density = 

degree = p4_degree$degree
deg_density = table(degree)[max(degree):1] %>%
  prop.table() %>%
  cumsum() %>%
  rev()
deg_spatial_density = rbind(deg_spatial_density,
                            data.frame(miceage = rep(4,max(degree)), degree = 1:max(degree), density = 

degree = p5_degree$degree
deg_density = table(degree)[max(degree):1] %>%
  prop.table() %>%
  cumsum() %>%
  rev()
deg_spatial_density = rbind(deg_spatial_density,
                            data.frame(miceage = rep(5,max(degree)), degree = 1:max(degree), density = 
```

```r
degree = p6_degree$degree
deg_density = table(degree)[max(degree):1] %>%
  prop.table() %>%
  cumsum() %>%
  rev()
deg_spatial_density = rbind(deg_spatial_density,
                            data.frame(miceage = rep(6,max(degree)), degree = 1:max(degree), density = d

degree = p7_degree$degree
deg_density = table(degree)[max(degree):1] %>%
  prop.table() %>%
  cumsum() %>%
  rev()
deg_spatial_density = rbind(deg_spatial_density,
                            data.frame(miceage = rep(7,max(degree)), degree = 1:max(degree), density = d

deg_spatial_density$miceage = as.factor(deg_spatial_density$miceage)
deg_spatial_density$degree = as.factor(deg_spatial_density$degree)
ggplot(deg_spatial_density, aes(x = degree, y = density, color = miceage, group = miceage)) +
  geom_line() +
  geom_point() +
  labs(x = "Number k of vessels branching out for one node",
       y = "% of branching points with node density >= k")
```