Simulation_3_res_visualization

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```
library(data.table)
```

```
## Warning: package 'data.table' was built under R version 4.4.2
```

```
library(ggplot2)
```

```
## Warning: package 'ggplot2' was built under R version 4.4.2
```

```
library(ggpubr)
```

```
## Warning: package 'ggpubr' was built under R version 4.4.2
```

```
sim3 <- fread("C:/Users/Qba Liu/Documents/STUDIA/BIOINF_MASTER_BERLIN/MASTER_THESIS/SIMULATION_POLIGON/S
head(sim3)
```

```
##    covariance_structures sample_sizes effect_sizes n_iters_maxtest power_global
##                   <char>        <int>        <int>           <int>        <num>
## 1:          Unstructured            5            1            1000            0
## 2:                 AR(1)            5            1            1000            0
## 3:                 AR(2)            5            1            1000            0
## 4:             Toeplitz             5            1            1000            0
## 5:          Unstructured            6            1            1000            0
## 6:                 AR(1)            6            1            1000            0
##    power_max
##        <num>
## 1:         0
## 2:         0
## 3:         0
## 4:         0
## 5:         0
## 6:         0
```

Stratify by covariance structure

```
Unst <- sim3[sim3$covariance_structures == 'Unstructured',]
AR1 <- sim3[sim3$covariance_structures == 'AR(1)']
AR2 <- sim3[sim3$covariance_structures == 'AR(2)']
Toe <- sim3[sim3$covariance_structures == 'Toeplitz']
```

Impact of the number of iterations (maxtest) on the power (of the maximum test)

Here I set the following variables to the following constant values.
- sample size –> 10 - effect size –> 2

```
plot1 <- ggplot(Unst[Unst$sample_sizes == 10 & Unst$effect_sizes == 2,], aes(x = n_iters_maxtest, y = po
  geom_point(color = "blue") +
  geom_line(color = "blue", linetype = "dashed") +
  ggtitle("Power of the maximum test across the number of iterations (Unstructured covariance matrix)")
  theme(plot.title = element_text(size = 5))

plot2 <- ggplot(AR1[AR1$sample_sizes == 10 & AR1$effect_sizes == 2,], aes(x = n_iters_maxtest, y = power
  geom_point(color = "red") +
  geom_line(color = "red", linetype = "dashed") +
  ggtitle("Power of the maximum test across the number of iterations (AR(1) covariance matrix)") +
  theme(plot.title = element_text(size = 5))

plot3 <- ggplot(AR2[AR2$sample_sizes == 10 & AR2$effect_sizes == 2,], aes(x = n_iters_maxtest, y = power
  geom_point(color = "orange") +
  geom_line(color = "orange", linetype = "dashed") +
  ggtitle("Power of the maximum test across the number of iterations (AR(2) covariance matrix)") +
  theme(plot.title = element_text(size = 5))

plot4 <- ggplot(Toe[Toe$sample_sizes == 10 & Toe$effect_sizes == 2,], aes(x = n_iters_maxtest, y = power
  geom_point(color = "magenta") +
  geom_line(color = "magenta", linetype = "dashed") +
  ggtitle("Power of the maximum test across the number of iterations (Toeplitz covariance matrix)") +
  theme(plot.title = element_text(size = 5))

combined_plot <- ggarrange(plot1, plot2, plot3, plot4, ncol = 2, nrow = 2)
annotate_figure(combined_plot,
                top = text_grob("Power of the maximum test across its number of iterations",
                                color = "black", face = "bold", size = 14))
```

Power of the maximum test across its number of iterations