**Reliability Estimation of *k*-Out-of-*n:* G System With Model Uncertainty**

This README is for the purpose of running the code accompanying Gao et al. (2023).

## Project Directory

Below is a list of all files contained in the *Reliability\_MA.rar* file:

1. **water.csv**: This file is the real dataset used by Gao et al. (2023), and includes 20 observations with rows denoting years and columns denoting months.
2. **Reliability\_MA.R**: This code implementation is based on Gao et al. (2023). We consider a reliability estimate for each observation and an estimate of the system reliability function. The input is “data” consisting of T observations with rows denoting observations and columns denoting nodes. The output includes reliability estimates for T observations and an estimate of the system reliability function.

## Example

install.packages(c("copula","VineCopula","Rsolnp"))  
library(copula)  
library(VineCopula)  
library(Rsolnp)

data <- read.csv("./water.csv")

out = Reliability\_MA(data = data)

out[[1]] ## reliability estimates for T observations

out[[2]] ## estimate of the system reliability function

Ziwen Gao, Dalei Yu & Xinyu Zhang (2023) Reliability estimation of *k*-out-of-*n*: G system with model uncertainty, *IEEE Transactions on Reliability*, DOI: 10.1109/TR.2023.3328842