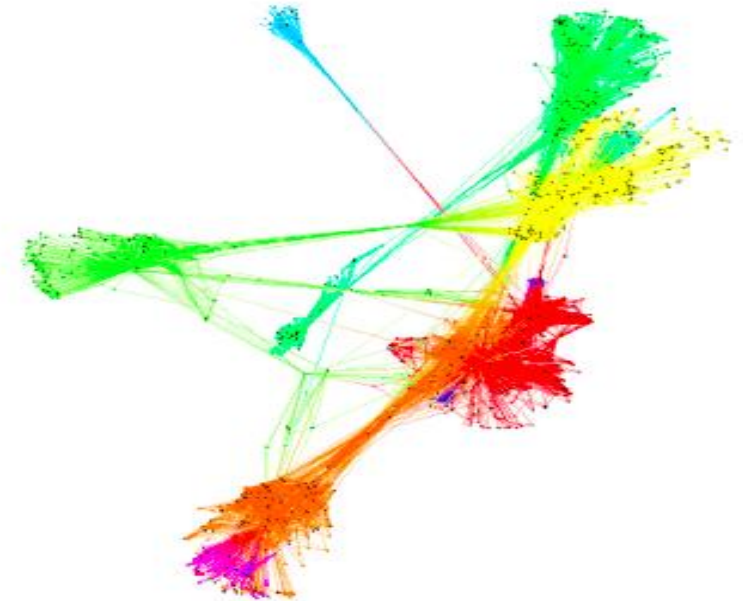


Black Boxes, XAI and Network Graphs

Dr. Jochen Papenbrock, CEO and Founder, Firamis GmbH

Software Partner for Applied Financial Data Science & AI

InvestTech | RiskTech | RegTech | SupTech

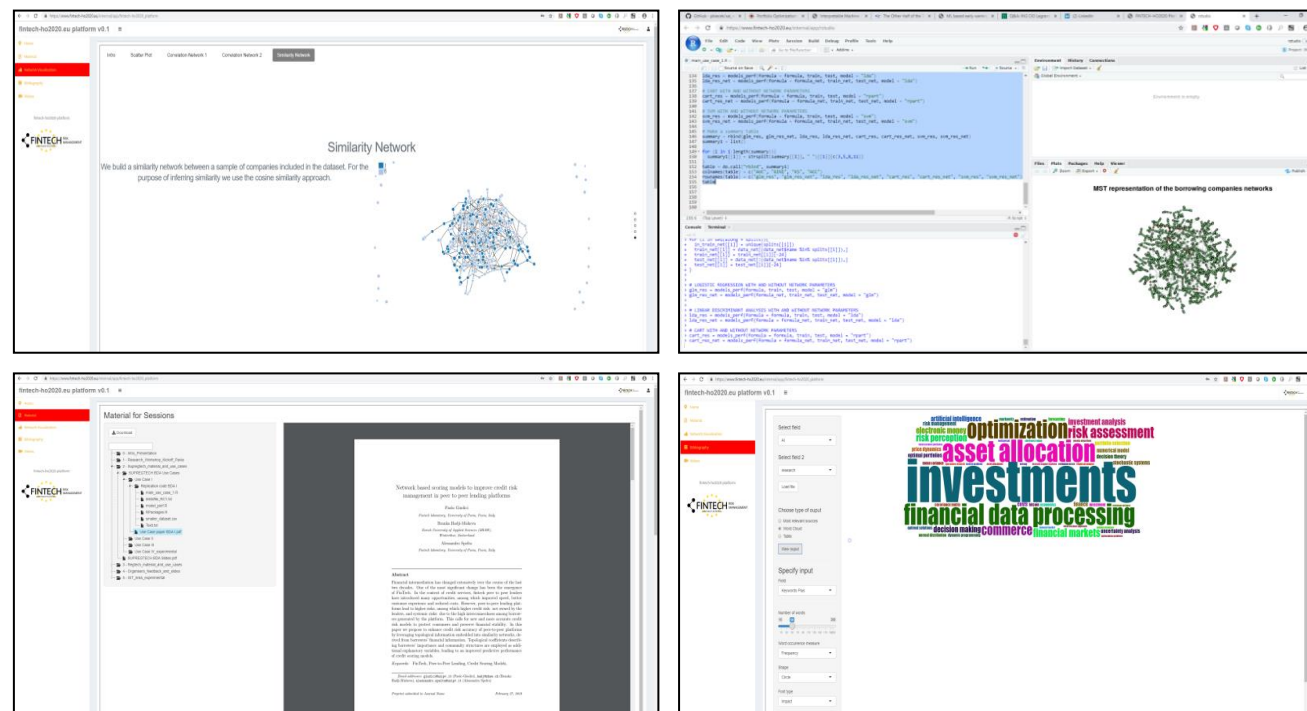


KNOWLEDGE AND CODING PLATFORM

FINANCIAL RISK AND ASSET MANAGEMENT WITH INTELLIGENT SYSTEMS

The platform is located in a login secured user area (<https://www.fintech-ho2020.eu/internal/login>) and includes:

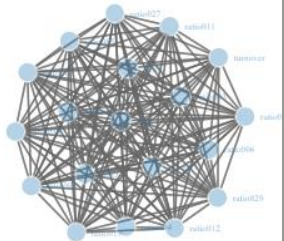
- Workshop presentations
- Links and articles
- Paper repositories
- Model demonstration and coding platform
- Workshop videos
- Event maps
- Digital learning tools
- Complex data visualisations



Online platform accessible to all stakeholders

Shared with all / Dropbox_Fintech / Suptech / SUPTECH BDA Use Cases / Use Case I

	Name ▲
	Replication code BDA I
☆	Replication code BDA I.zip
☆	Use Case paper BDA I.pdf



Market structure discovery with clique forests
(Massara G., Aste T.)

Material for Sessions

- Download Open in RStudio
- 0 - Intro_Presentation
 - 1 - Research_Workshop_Kickoff_Pavia
 - 2 - Supregtech_material_and_use_cases
 - SUPREGTECH BDA Use Cases
 - SUPREGTECH BDA Slides.pdf
 - 3 - Regtech_material_and_use_cases
 - Code_for_use_cases
 - data_final_stand.csv
 - DescriptionAndrea.html
 - DescriptionAndrea.Rmd
 - final_dataset_mfi_test.csv
 - final_dataset_mfi.csv
 - final_dataset_smes_and.csv
 - final_dataset_smes.csv
 - Logit_model_test.html
 - Logit_model_test.Rmd
 - RandomForest_test.html
 - RandomForest_test.Rmd
 - Training_and_testing_models.Rmd
 - Training_and_testing_models_mfi.html
 - Training_and_testing_models_mfi.Rmd
 - Training_and_testing_models.html
 - Training_and_testing_models.Rmd
 - 4 - Organisers_feedback_and_slides
 - 5 - GIT_links_experimental

```
...geom_histogram(aes(y = stat(count/nrow(data))),colour="black",binwidth = 10)+ xlim(-10, 180)

...#Size dependency of ratios
Let us see if there is different behaviour of other ratios depending on size
...{r plots, echo=FALSE}
multiplot <- function(..., plotlist=NULL, file, cols=1, layout=NULL) {
  require(grid)

  # Make a list from the ... arguments and plotlist
  plots <- c(list(...), plotlist)

  numPlots = length(plots)

  # If layout is NULL, then use 'cols' to determine layout
  if (is.null(layout)) {
    layout <- matrix(seq(1, cols * ceiling(numPlots/cols)),
                      ncol = cols, nrow = ceiling(numPlots/cols))
  }

  if (numPlots==1) {
    print(plots[[1]])
  } else {
    # Set up the page
    grid.newpage()
    pushViewport(viewport(layout = grid.layout(nrow(layout), ncol(layout))))

    # Make each plot, in the correct location
    for (i in 1:numPlots) {
      # Get the i,j matrix positions of the regions that contain this subplot
      matchidx <- as.data.frame(which(layout == i, arr.ind = TRUE))

      print(plots[[i]], vp = viewport(layout.pos.row = matchidx$row,
                                      layout.pos.col = matchidx$col))
    }
  }
}

x <- c(.05,.10, .25, .50, .75, .90)
dat <- data.frame(
  quantiles = x,
  q_lev_2 = quantile(data2$leverage, x),
  q_flev_2 = quantile(data2$fin_leverage, x),
  q_qr_2 = quantile(data2$quick_ratio, x),
  q_cr_2 = quantile(data2$current_ratio, x),
  q_roi_2 = quantile(data2$ROI, x),
  q_roe_2 = quantile(data2$ROE, x),
  n_obs = nrow(data2$varname)
)
```

AI-based
solutions in
Finance

Improving
Scoring Model



Explainable AI can help!

Explainable AI (XAI):
businesses must justify how their models arrive at their decisions. To build trust with users and stakeholders, application leaders must make these models more interpretable and explainable.

- common level of model understanding of all stakeholder
- model validation
- benchmarking

Black box models will not be accepted!

Traditional Statistics

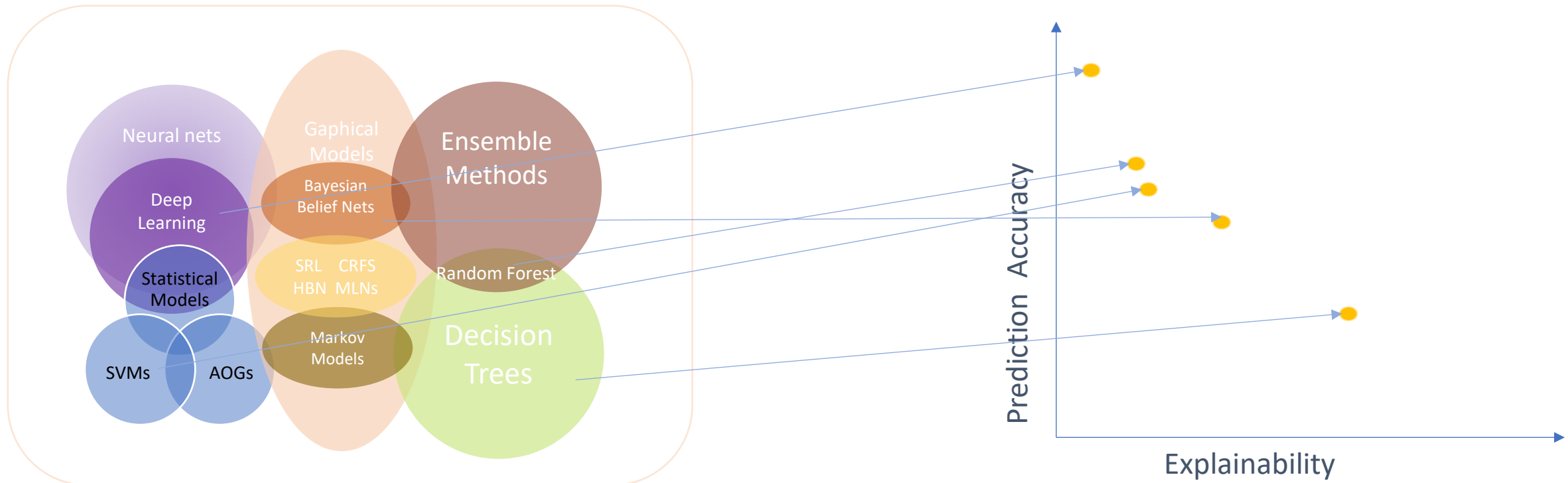
White-box modelling

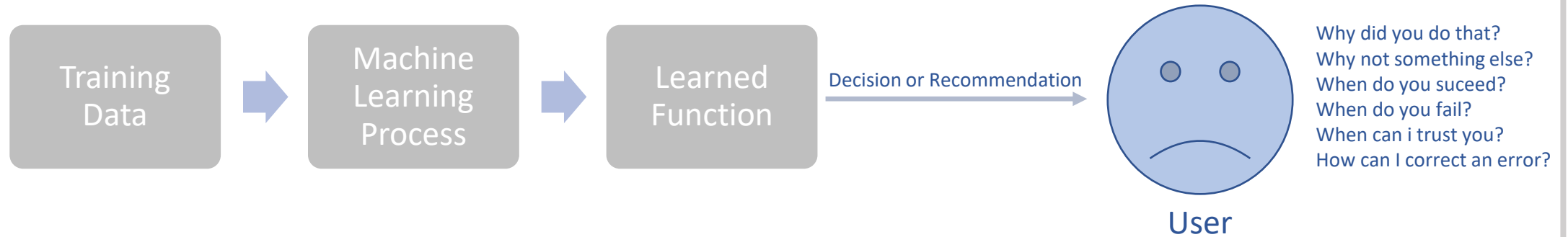
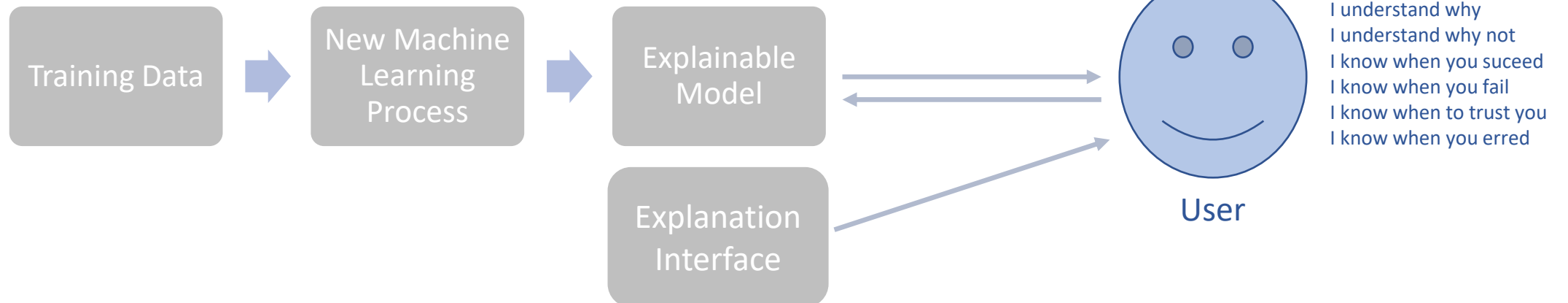
Simpler computation, emphasis on introspection, form, causal effects and processes, finding a correct model

Machine Learning

Black-box modelling

high computational complexity, emphasis on speed and quality of prediction, finding a 'performant' model



Standard approach**XAI**

Panel discussion with...



Thorsten Seeger

Experienced financial services professional



Julian Arevalo

Senior Expert on Financial Innovation at EIOPA. Involved in FinTech/Insur-Tech and Big Data Analytics.



Gilles Bouvier

Supervisor at the ECB's SSM Fintech team



Dr. Michael Jünemann

Heads the German Banking & Finance practice of Bird & Bird LLP, advises on all aspects of banking regulatory and finance law.



Carsten Zecher

Senior Manager at KPMG, he focuses on Non-Financial Risk Management in Financial Services.

Panel discussion topics

- Usefulness of sandbox
- Black box
- Cultural transformation
- Standards and Harmonisation
- Data quality issues / New Data