Performance evaluation and optimisation through the TIFAR-framework.
Partners of REPRO

Academic Partners

- CWI
- TU Delft
- VU

Project Partners

- Ambulance Amsterdam
- connexxion
- GGD
- Flevoland
- ravu

Finances By

- STW
Goal of this talk

1) Show the tool we develop in REPRO
2) Receive your feedback for continuation

Central TIFAR-tools in this talk

- Dispatch Simulator
- Emergency Medical Call Center Simulator
- Optimiser
Classes of TIFAR

Main

Environment
Calls
Fleet
Navigator & Resolver
EMCC
Log

Vertex
Vertex
Call
Call
Ambu
Ambu
Route
Route
CC Agent
CC Agent
Entry
Entry

DBs
Initiator
Scheduler
Timer
GUI
Optimiser
All built around ambulance data!

We use multiple databases:
- Call records (RAVIS, Opencare Ambu, Ambite, Mios(+))
- Call Center Records (Arbi)
- Duty Rosters
- Base and Hospital Locations

- EXT: Geographical Information
- EXT: Addresses and Buildings

External tools:
- CityGIS Navigator for shortest path and route information
  - RIVM Look-up table
- Quantum GIS for maps
TIFAR Dispatch Simulator

**Purpose**
To evaluate dispatch strategies:
- DAM
- Major happenings, regional changes

**Input**
We use the following as input:
- Regional geographical information
- Demand information (where & quant.)
- Fleet information
- Dispatch policy

**Output**
- Call record database -> All possible performance indicators!
TIFAR Dispatch Simulator

Demo!
Performance evaluation and optimisation through the TIFAR-framework.
TIFAR EMCC Simulator
Joint work with Geert Jan Kommer

Purpose
To evaluate call center staffings:
- Performance given a staffing

Input
We use the following as input:
- Interarrival time distributions (Call intensities)
- Feedback probabilities
- Service time distributions (Call durations)
- Staffing (Call takers, Dispatchers, Generalists)

Output
- Call Center Records ‘arbi’
  - All possible performance EMCC indicators!

Purpose
To evaluate call center staffings:
- Performance given a staffing

Input
We use the following as input:
- Interarrival time distributions (Call intensities)
- Feedback probabilities
- Service time distributions (Call durations)
- Staffing (Call takers, Dispatchers, Generalists)

Output
- Call Center Records ‘arbi’
  - All possible performance EMCC indicators!
TIFAR EMCC Simulator

Demo!
TIFAR EMCC Simulator

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TIFAR Optimiser
Joint work with Theresia van Essen

Purpose
To find ‘optimal’ staffing using Erlang blocking per demand pt. (WIP)

Input
We use the following as input:
- Demand information
- Possible base locations and hospitals
- Service time constants
- Performance indicators

Output
- Staffing per base, graphical and textual in the log.
TIFAR EMCC Simulator

Demo!
Performance evaluation and optimisation through the TIFAR-framework.

1st International Workshop on Planning of Emergency Services

Martin van Buuren
Future Research

- Validate all models:
  - Theory and Practice
- Implementing REPRO policies into TIFAR
- Combining optimisation tools with evaluations
  - for real time decision support tools.
- Better user interface for mostly used indicators
- Help out our partners and make great articles!
Concluding

- TIFAR is an all round ambulance simulation framework, incl:
  - Simulating the ‘road domain’
  - Simulating the ‘call center domain’
  - Decision support for tactical decisions
- Many performance indicators possible
- Useful for evaluating dispatch rules & DAM