IJCNN'08 Results of the NN5 Time Series Forecasting Competition

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Agenda

NN3 Forecasting Competition

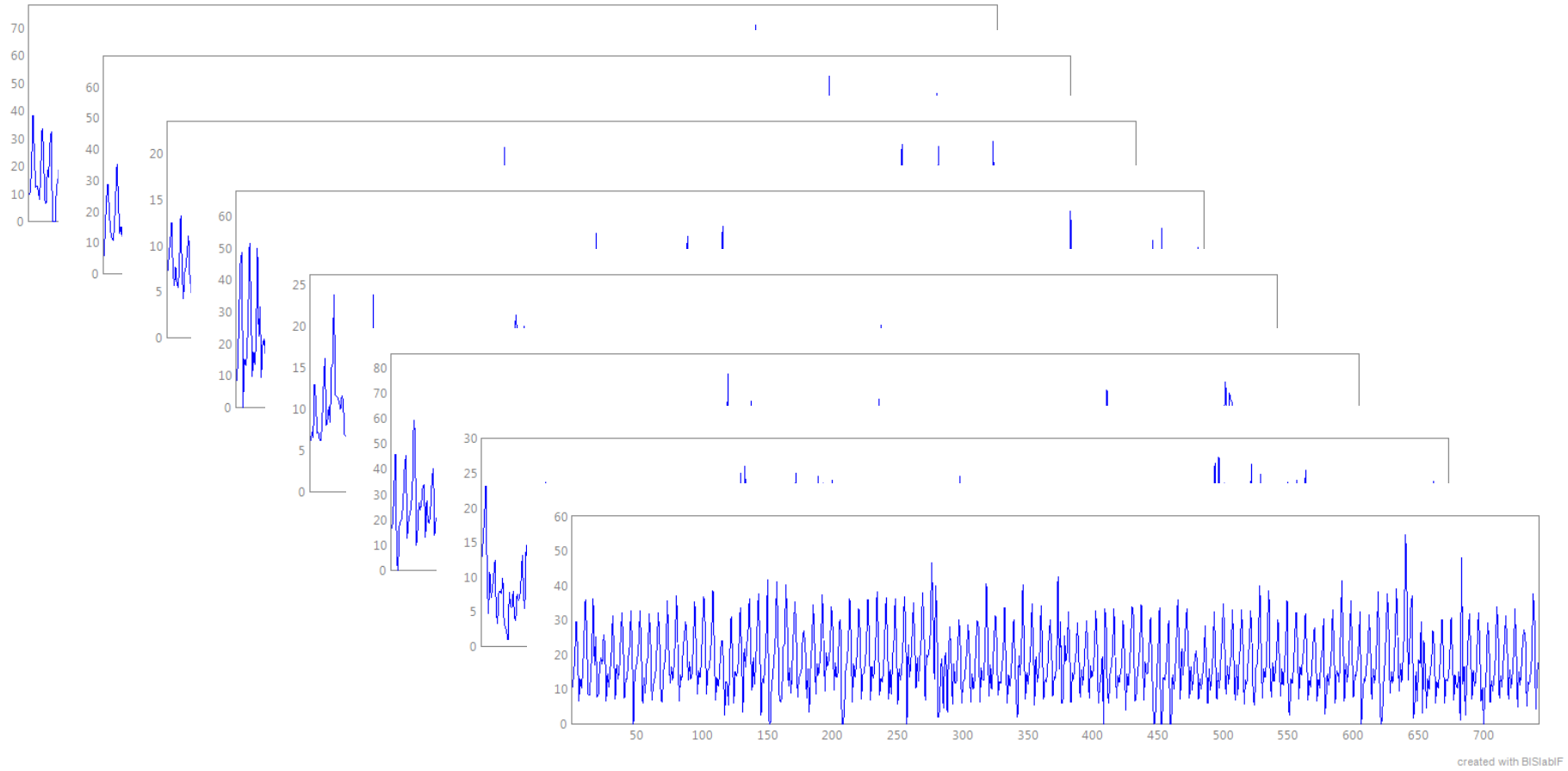
- The Problem
- The Solution: empirical evaluation
  - Competition Design
  - Competition Timing
- The Results
  - Reduced Dataset
  - Complete Dataset
- Feedback & Suggestions

→ An empirical evaluation of NN Modelling & Forecasting

NN5

Forecasting Competition for Artificial Neural Networks & Computational Intelligence

www.neural-forecasting-competition.com



Forecast a set of 11 or 111 time series of ...

... Daily cash money withdrawals at cash-machines in UK

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- **Dataset**
- **2 years of daily cash money demand at cash machines (ATMs) at different locations in England**
- **Cash machines operate as miniature "retail outlets" and provide cash money to customers.**

- **The data may contain a number of time series patterns including multiple overlying seasonality, local trends, structural breaks, outliers, zero and missing values etc.**
- **Plus causal forces driven by the underlying yearly calendar, such as reoccurring seasonal periods, bank holidays, or special events of different length and magnitude of impact, with different lead and lag effects.**

→Multiple overlying time series patterns
→Increased complexity to NN3

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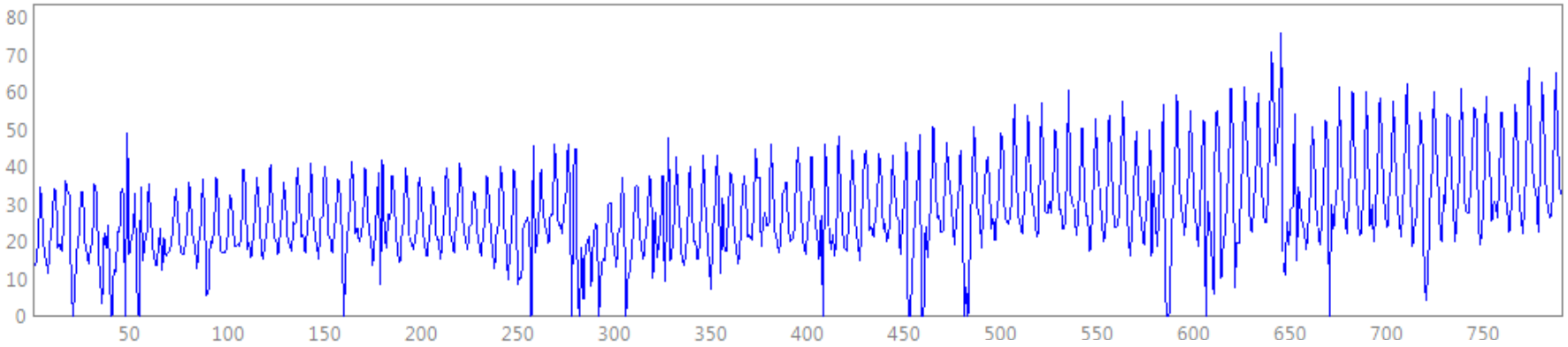

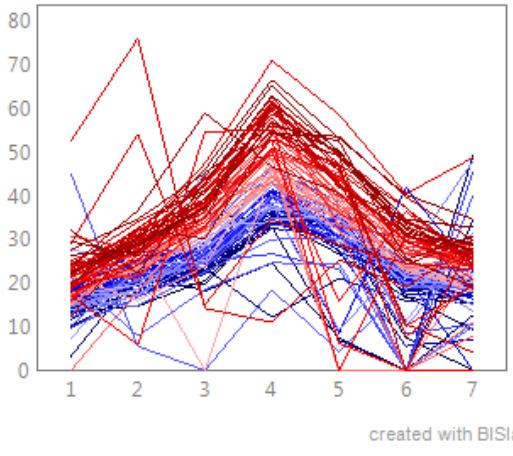

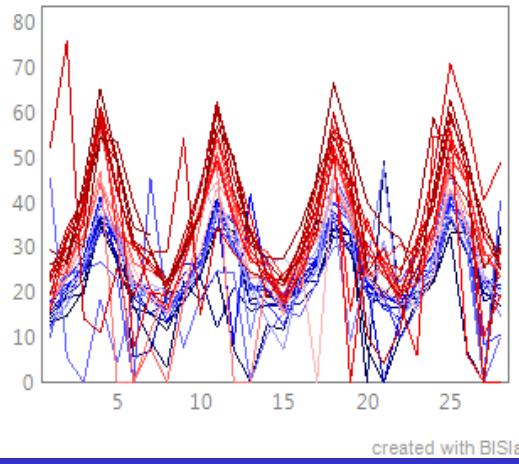

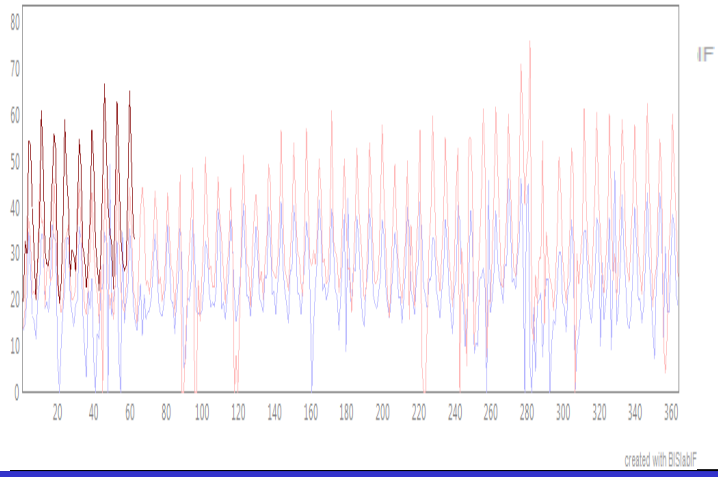

→ Various challenges in the time series

→ Heterogeneous data patterns within same domain

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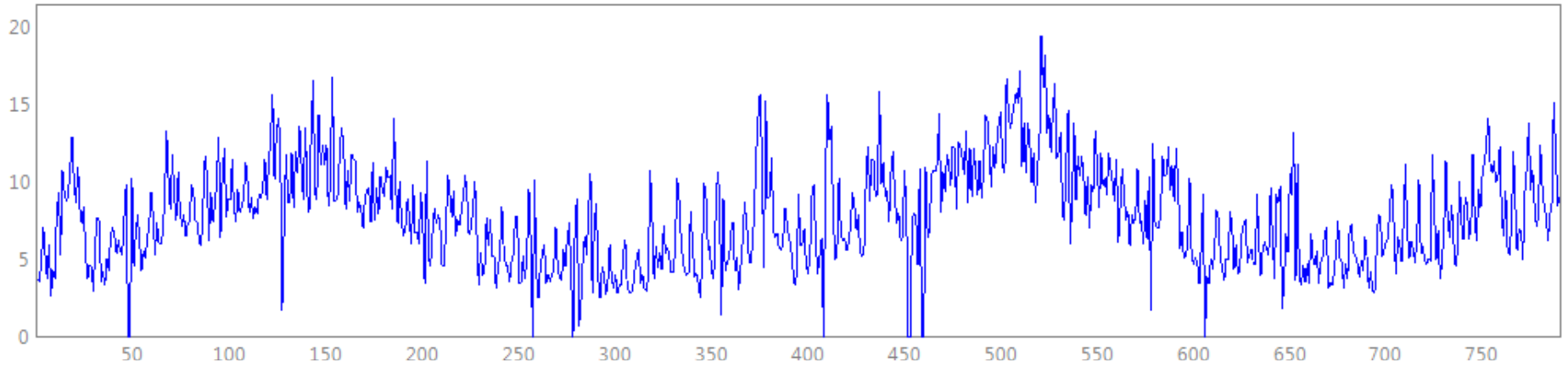

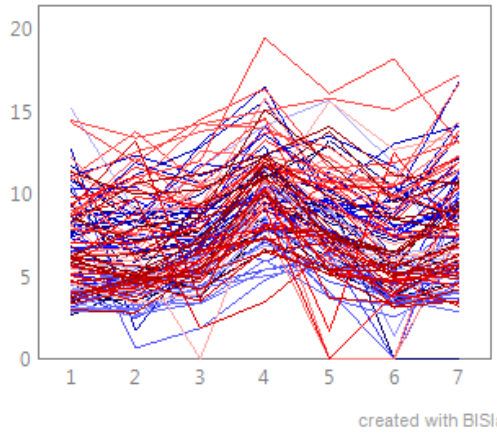

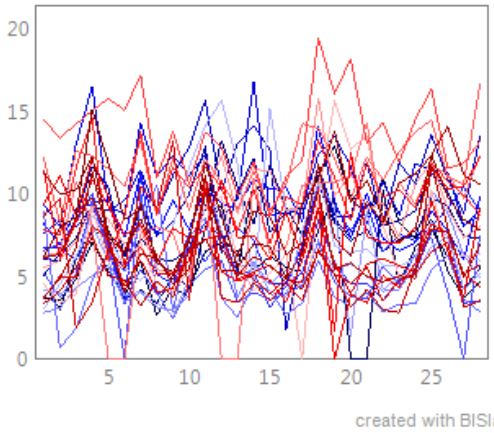

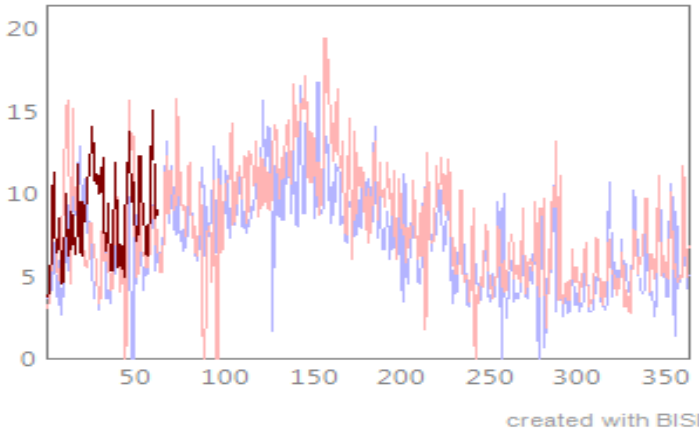

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- **Objective**
  Forecast a set of 11 or 111 time series as accurately as possible, using methods from computational intelligence and a consistent methodology.

- **Dataset A - Complete dataset of 111 time series**
- **Dataset B - Reduced sub sample of 11 time series**

- **Data & Domain Origin**
  Unknown, but drawn from homogeneous population of monthly empirical business time series.

→evaluate progress in modelling CI-methods for time series forecasting & to disseminate knowledge on “best practices”.

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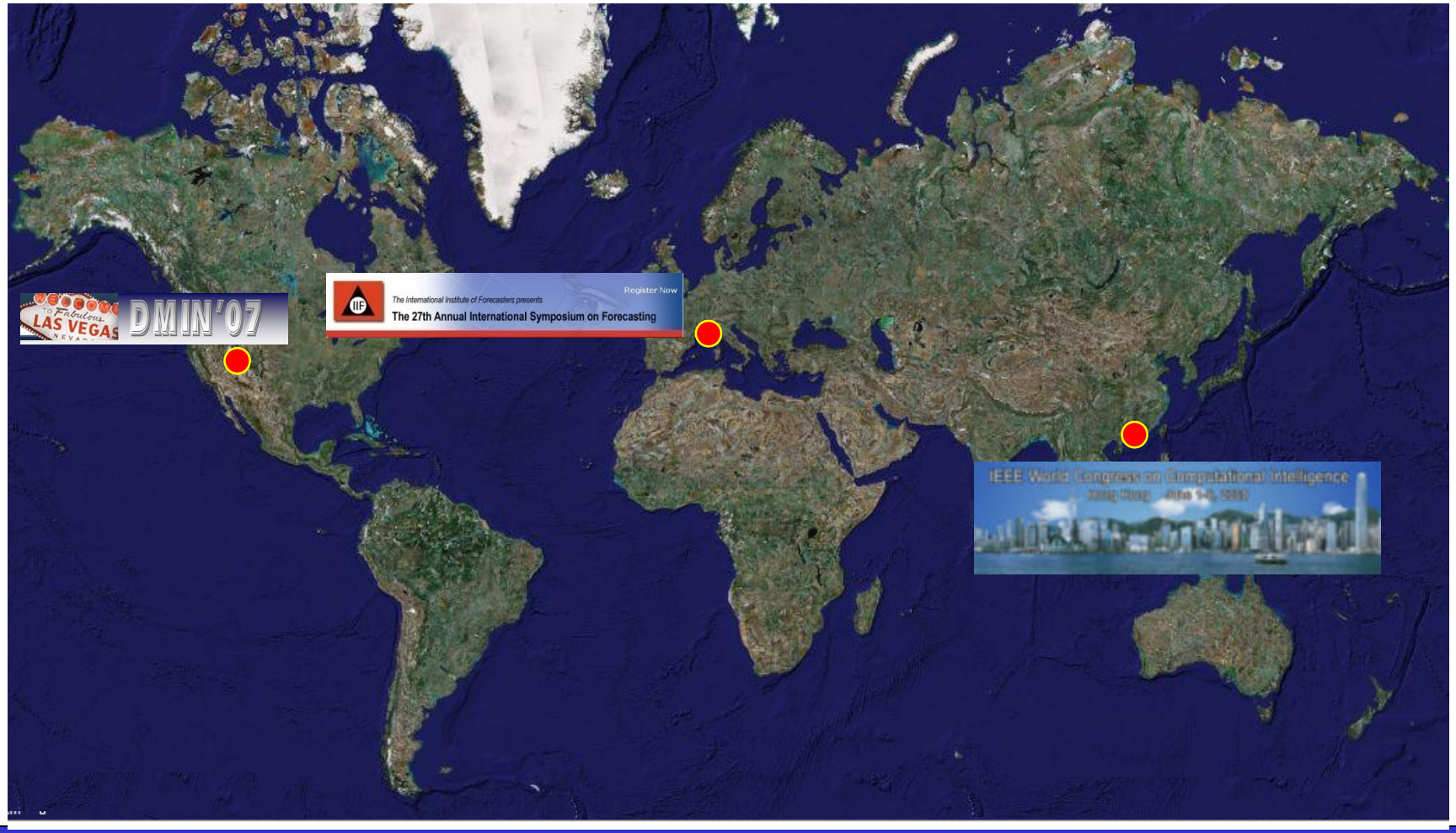

→Multiple locations → tailor to different "budgets"

→Future extensions

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Forecasting Competition for Artificial Neural Networks & Computational Intelligence

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- **IJCNN'08 Awards**
  - **Lowest SMAPE on complete dataset**
  - **Lowest SMAPE on reduced dataset**

  → Fame (little fortune through 1 free registration)

- **NN5 Rewards**
  - **Publication as full paper in "Advances in Neural Forecasting", Springer Series of Computational Intelligence, (ISI SCI, DBLP etc. indexed)**
  - **Invitation for special issue of the IJF**
  - **Invitation to participate in Events ISF'08, IJCNN08 & DMIN'08**

→evaluate progress in modeling CI-methods for time series forecasting & to disseminate knowledge on "best practices".

Thank You

IJCNN organisers, chairs & Isabelle Guyon!
International Journal of Forecasting (Rob Hyndman)
Studies in Computational Intelligence (Janusz Kacprzyk & Springer)
NN3 contestants for patience with publication

The contestants for …
→ 8,905 visitors, 13,200 visits & 39,500 page impressions
→ 430 registered contestants – 332 downloaded datasets
→ 27 submissions for the complete & 40 for reduced dataset

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And the winner is ...

111 - Complete Dataset

11 - Reduced Dataset

→ … who is present?

ID	Contestant	SMAPE	Rank
B02	Wildi	19.9%	1
C23	Andrawis	20.4%	2
C12	Vogel	20.5%	3
C10	D'yakonov	20.6%	4
B08	Noncheva	21.1%	5
C04	Hung	21.3%	6
C06	Rauch	21.7%	7
C19	Luna	21.8%	8
B05	Lagoo	21.9%	9
C07	Gutierrez	21.9%	10
C01	Wichard	22.1%	11
C17	Gao	22.3%	12
C08	Puma-Villanueva	23.7%	13
B09	Merkusheva	23.8%	14
B01	ARIMA(Autobox)	24.1%	15
B04	Lewicke	24.5%	16
B07	Brentnall	24.8%	17
B03	Beadle	24.9%	18
C09	Dang	25.3%	19
C05	Pasero	25.3%	20
C24	Adeodato	25.3%	21
C18	Fillon	25.4%	22
C25	...	26.8%	23
C20	…	27.3%	24
C26	…	28.1%	25
C29	… Naïve Season	28.2%	26
C15	…	30.2%	27
C16	…	30.6%	28
C11	…	31.5%	29
C14	…	33.1%	30
C13	…	34.7%	31
C28	…	36.3%	32
C03	…	40.1%	33
C22	…	41.3%	34
C02	…	45.4%	35
C27	… Naïve	47.4%	36
C21	…	53.5%	37

→ Reduced Dataset

SMAPE		Mean	Rank
B02	Wildi	19.9%	1
C23	Andrawis	20.4%	2
C12	Vogel	20.5%	3
C10	D'yakonov	20.6%	4
B08	Noncheva	21.1%	5
C06	Rauch	21.7%	6
C19	Luna	21.8%	7
B05	Lagoo	21.9%	8
C01	Wichard	22.1%	9
C17	Gao	22.3%	10
C08	Puma-Villanueva	23.7%	11
B01	ARIMA (Autobox)	24.1%	12
B04	Lewicke	24.5%	13
B07	Brentnall	24.8%	14
C09	Dang	25.3%	15
C05	Pasero	25.3%	16
C24	Adeodato	25.3%	17
C25	Coyle	26.8%	18
C20		27.3%	19
C26		28.1%	20
C14		33.1%	21
C28 (was B6)		36.3%	22

→ Complete Dataset

NN5

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And the winner is ...

1st place: Gao & Sollacher
Siemens Research

2nd place: Gao & Sollacher
Siemens Research

1st place: Gao & Sollacher
Siemens Research

2nd place: Gao & Sollacher
Siemens Research

The contestants for …
→ Two datasets of 11 time series & 111 time series

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Comments?

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