A Locally Parameter Element Wise Linear Transformations Based Forecasting Model For Dynamic State Systems With Large Number Of Parameters

January 2001 through December 2004. Rewritten February 15th, 16th, 17th, March 6th, 7th, 8th 2016 Anno Domini

Author: **Ramesh Chandra Bagadi**
Founder, Owner, Co-Director And Advising Scientist In Principal
Ramesh Bagadi Consulting LLC, Madison, Wisconsin-53715, United States Of America.
Email: rameshcbagadi@uwalumni.com

White Paper One {TRL122}
of
Ramesh Bagadi Consulting LLC, Advanced Concepts & Think-Tank,
Technology Assistance & Innovation Center, Madison, Wisconsin-53715,
United States Of America

Abstract

In this research investigation, the author has presented '*A Locally Parameter Element Wise Linear Transformations Based Forecasting Model For Dynamic State Systems With Large Number Of Parameters*'.

Theory

Firstly, we represent any *Dynamic State System* using a *State Vector* (*Row Vector*) of a specified size, say

$$V_i = [V_i(1) \quad V_i(2) \quad V_i(3) \quad . \quad . \quad . \quad V_i(n-2) \quad V_i(n-1) \quad V_i(n)]$$

That is,

$$\overline{V_i} = [V_i(1) \quad V_i(2) \quad V_i(3) \quad . \quad . \quad . \quad V_i(n-2) \quad V_i(n-1) \quad V_i(n)]$$

$$\overline{V_i} = \sum_{j=1}^{n} \{[V_i(j)]\hat{e}_j\}$$

Here, the *State Vector* has n parameters that are Evolving with time.

For the time instant $i = k$, we have the *State Vector* given by

$$\overline{V_k} = [V_k(1) \quad V_k(2) \quad V_k(3) \quad . \quad . \quad . \quad V_k(n-2) \quad V_k(n-1) \quad V_k(n)]$$

Let the *State Vector* be defined for $i = 1$ to $i = m$ instants.

We now *Normalize* all $\overline{V_i}$ for $i = 1$ to $i = m$.

The *Normalization* is given by

$$\hat{V_i} = \frac{\overline{V_i}}{\left\{\sum_{j=1}^{n} [V_i(j)]^2\right\}^{1/2}}$$

That is,

$$\hat{V}_i = \frac{\sum_{j=1}^{n} \{[V_i(j)]\hat{e}_j\}}{\left\{\sum_{j=1}^{n} [V_i(j)]^2\right\}^{1/2}}$$

We now define $T_{s_j \to (s+1)_j}(j) = \frac{\hat{V}_{(s+1)_j}(j)}{\hat{V}_{s_j}(j)}$

We define

$$\hat{V}_{m+1}(j) = \{\hat{V}_m(j)\}\left[\left(T_{u_j \to (u+1)_j}(j)\right) + \{\hat{V}_{m_j}(j) - \hat{V}_{u_j}(j)\}\left\{\frac{\left(T_{(u+1)_j \to (u+2)_j}(j)\right) - \left(T_{u_j \to (u+1)_j}(j)\right)}{\hat{V}_{(u+1)_j}(j) - \hat{V}_{u_j}(j)}\right\}\right]$$

where $\hat{V}_{u_j}(j) < \hat{V}_{m_j}(j) < \hat{V}_{(u+1)_j}(j)$ for $1 \le u_j < m$.

Using the constraint that all the $|\overline{V}_i|$ for $i = 1$ to $i = m+1$ form One Normal Data Set, we calculate the value of $|\overline{V}_{m+1}|$

i.e., we calculate α at around the value of $|V_m|$ such that $|\overline{V}_{m+1}| = |V_m| + \alpha$ such that the $|\overline{V}_i|$ for $i = 1$ to $i = m+1$ form One Normal Data Set, where α is a Real Scalar Value.

Finally, we have

$\overline{V}_{m+1} = |V_{m+1}|\hat{V}_{m+1}$.

Conclusion

This Scheme can be used to predict the *One Step Evolution* of any *Dynamic State System* with Large Number of Parameters.

Moral

Clear Waters Run Deep.

References

Ramesh Chandra Bagadi

www.vixra.org/author/ramesh_chandra_bagadi

Acknowledgements

The author would like to express his deepest gratitude to all the members of his loving family, respectable teachers, en-dear-able friends, inspiring Social Figures, highly esteemed Professors, reverence deserving Deities that have deeply contributed in the formation of the necessary scientific temperament and the social and personal outlook of the author that has resulted in the conception, preparation and authoring of this research manuscript document.

Tribute

The author pays his sincere tribute to all those dedicated and sincere folk of academia, industry and elsewhere who have sacrificed a lot of their structured leisure time and have painstakingly authored treatises on Science, Engineering, Mathematics, Art and Philosophy covering all the developments from time immemorial until then, in their supreme works. It is standing on such treasure of foundation of knowledge, aided with an iota of personal god-gifted creativity that the author bases his foray of wild excursions into the understanding of natural phenomenon and forms new premises and scientifically surmises plausible laws. The author strongly reiterates his sense of gratitude and infinite indebtedness to all such '<u>Philosophical Statesmen</u>' that are evergreen personal librarians of Science, Art, Mathematics and Philosophy.

Dedication

*All of the aforementioned Research Works, inclusive of this One are **Dedicated to Lord Shiva**.*