

# REFEREE REPORT

By Professor PhD Nikolai Manev,

The Institute of Mathematics and Informatics - BAS

On the announced competition for a position of Professor in the

Professional field: 4.5. *Mathematics*,

Scientific specialty: *Mathematical Modeling and Applications of Mathematics*

*(Monte Carlo u Quasi Monte Carlo Algorithms and Applications)*

## 1. General description of the procedure and submitted documents

The competition for a position "Professor" subject of this report is announced in the State Gazette (Darzhaven vestnik) no. 41 / 21.05.2019. The open position is at department „High Performance Computer Systems, Networks and Algorithms“ of the Institute of Information and Communication Technologies – BAS (IICT).

There is only one applicant, namely

**assoc. prof. PhD Todor Vassilev Gurov**

## 2. Candidate's Biographical data.

Todor Gurov received Ms Degree on numerical methods in 1987 at SU „St. Kliment Ohridski“. The Ph.D. degree was conferred on him in 1999 after defending the thesis titled „Monte Carlo algorithms for some transportation problems“. Since 2004 he has been Associate professor at IICT. During 24 months in the period 1999 – 2001 Todor Gurov was post doctoral fellow at City University of New York, Bucklin Collage. For periods of 1 to 6 months the candidate was with RWTH - Aachen, Lehrstuhl fur

Информатик I, Germany, IMAG – Grenoble, Informatics and Distribution (ID) Lab., France, and Edinburgh Parallel Computer Centre, University of Edinburgh, Scotland.

The aforesaid confirms that Todor Gurov corresponds exactly to the requirements of article 29(1) of ЗРАСРБ and article 60(1) of Правилника за приложението му.

### **3. Description and estimation of the research, papers and contributions in them**

T. Gurov is presented a list of **26 papers** which are written after his habilitation. **4** of them have **impact factor**, **18** are with **SJR**, **one is a chapter**, and the rest appear in **Scopus and Web of Science, too**. All papers are join work with other researchers that is typical for his research area. The numerical indicators corresponding to the presented papers **exceed the legislative requirements**.

Scientific interests of Todor Gurov are mainly in the area of Monte Carlo and Quasi Monte Carlo numerical methods and their applications to other scientific areas. The works can be classified into five groups:

- 1. Development of Monte Carlo and hybrid Monte Carlo algorithms for simulation of quantum and electron transport in supper small devices.** This group contains papers with numbers [2, 5, 6, 8, 13] from the list of publications.
- 2. Development of GRID library SALUTE (Stochastic ALgorithms for Ultra-fast Transport in sEmiconductors), by integrating several Monte Carlo, Quasi Monte Carlo, and hybrid algorithms for solving quantum-kinetic equations.** This group consists of papers [7, 10, 12, 19].
- 3. Monte Carlo approach to the rendering equation ( Cook-Torrance model ) and to the problem of reconstruction of unknown density based on a given sample.** The results are presented in [3, 18].

4. **Study of the sensitivity of some Monte Carlo and Quasi Monte Carlo methods of approximate calculation of multiple integrals and solving integral equations using a variety of random number generators and applying techniques for variance reduction.** [9, 11, 14, 16].
5. **Study of the scalability and energy efficiency of a class of Monte Carlo and Quasi-Monte Carlo algorithms running on hybrid High Performance Systems.** [1, 17, 21, 22, 24, 25, 26].

The resumes of the papers and list of scientific contributions of the candidate included in his application describe truthfully the content of the papers and represent correctly the candidate's scientific contributions. The style of the papers is very good.

#### **4. Characterization of the scientific-organizational and educational activity of candidates**

Todor Gurov has been a leading researcher or member of the Bulgarian team of 7 and 12 international projects (mainly financed by EC), respectively. He has been leading researcher of 4 (member of the team of 10) national projects. He has been member of Program Committees of 3 international conferences.

The candidate has given lectures on Numerical methods and Monte Carlo algorithms at three Bulgarian universities. He has two PhD students successfully finished their studies in 2019.

#### **5. Assessment of the personal contribution of the candidate in joint works**

In my opinion the personal contribution of T. Gurov is at least equipollent.

## 6. Impact of the candidate's results on work of other scientists

T. Gurov has presented a list of **74** appeared in **SCOPUS** and/or **Web of Science** papers of other authors citing his results. Another list of **100** other citations is also submitted. This number exceeds the legislative requirements.

My conclusion is that **Todor Gurov is well known to the researchers working in his scientific area.**

## CONCLUSION

On the grounds of varied scientific and scientific-organizational work of Todor Vassilev Gurov I can declare without any hesitation that he meets the legislative requirements (Законa за развитие на академичния състав в Република България (ЗРАСРБ), Правилника за прилагане на ЗРАСРБ, Правилника на БАН за прилагане на ЗРАСРБ), and the requirement of ИИСТ for the rank and position of "Professor". **I give my positive estimation with conviction and recommend to the Selecting Committee to propose to the Scientific Council of ИИСТ to confer on assoc. prof. PhD Todor Vassilev Gurov the rank and position "Professor" in professional field: 4.5. Mathematics; scientific specialty: Mathematical Modeling and Applications of Mathematics (Monte Carlo и Quasi Monte Carlo Algorithms and Applications)**

10.09. 2019 г.

Signature:

