Prof. Sobol' at a seminar on Monte Carlo methods, September 2001 in Salzburg.

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Ilya M. Sobol

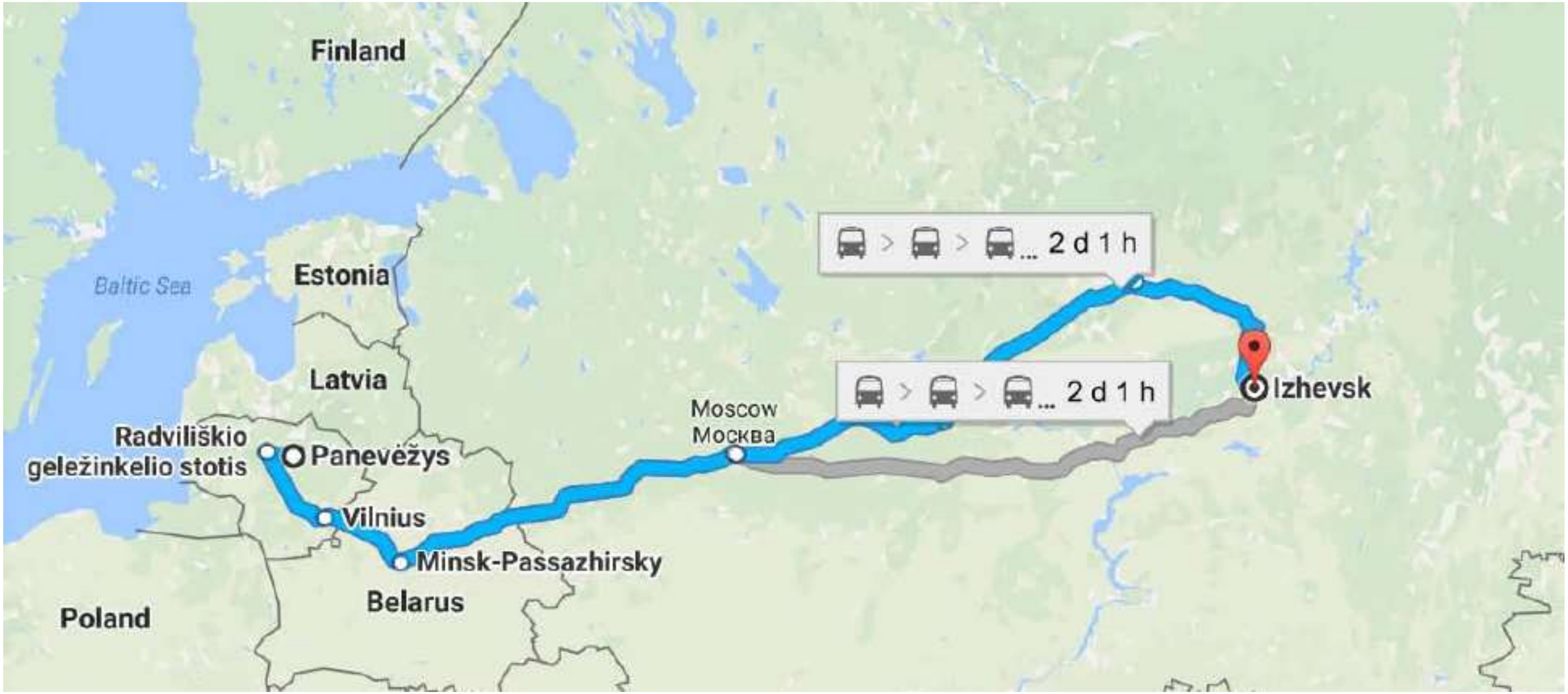
From Wikipedia, the free encyclopedia

Ilya Meyerovich Sobol (born 15 August 1926) (Russian: Илья Меерович Соболь) is a Russian mathematician of Jewish Lithuanian origin, known for his work on Monte Carlo methods. His research spanned several applications, from nuclear studies to astrophysics, and contributed significantly to the field of sensitivity analysis.

Prof. Sobol' s Wikipedia entry: lead section

Biography [edit]

Ilya Meyerovich Sobol was born on August 15, 1926, in Panevėžys (Lithuania). When World War II reached Lithuania his family was evacuated to Izhevsk.



Graduated with distinction in 1948 @ Moscow State University. Among his teachers Alexander Kolmogorov

@ Institute of Applied Mathematics of the USSR Academy of Sciences

@ Department of Mathematical Physics of the Moscow Engineering Physics Institute

Contributor to the Journal of Computational Mathematics and Mathematical Physics

Worked on the A and H bombs, on astrophysics (Sunyaev-Zel'dovich effect), multi-objective optimization & decision making, and on sensitivity analysis

Wrote a very popular book on Monte Carlo Methods

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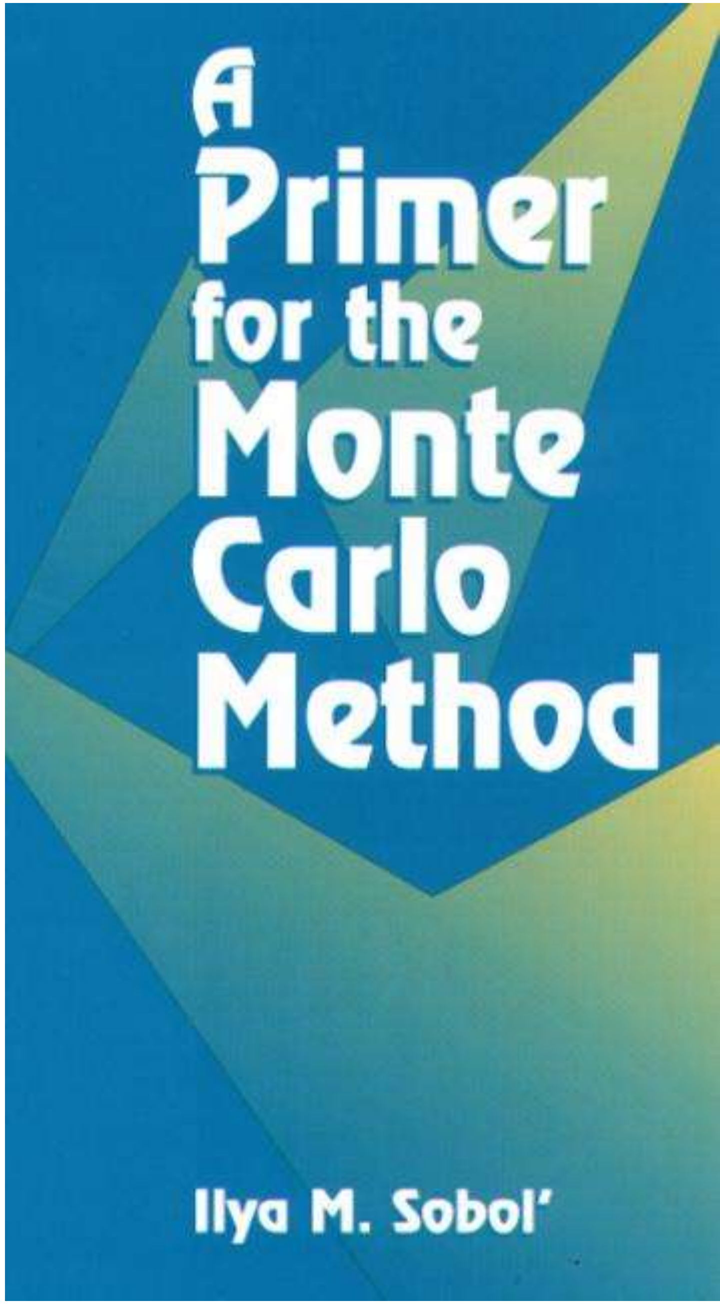
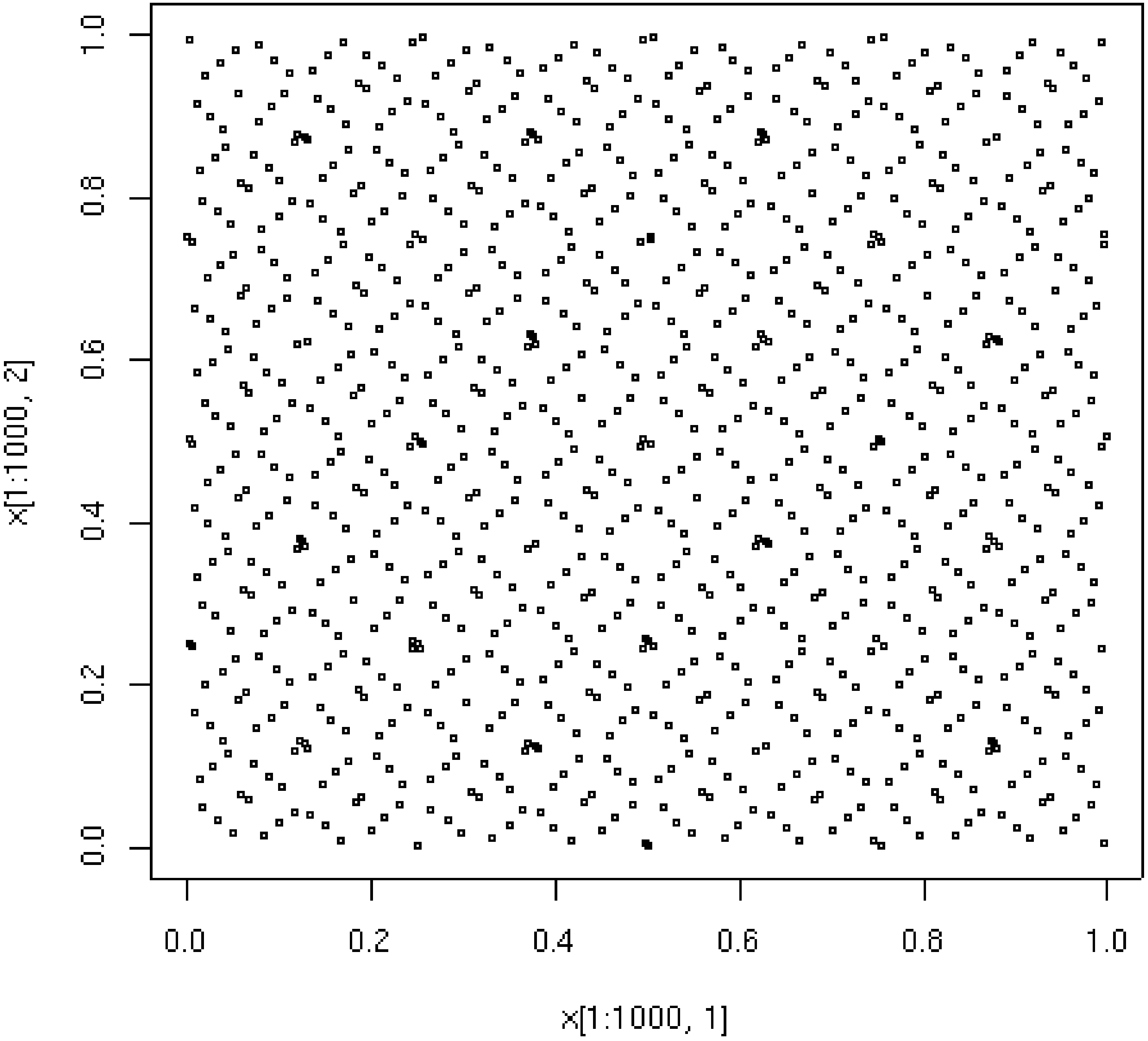


Developed the LP_τ sequences

"Preponderance of the experimental evidence amassed to date points to Sobol' sequences as the most effective quasi-Monte Carlo method for application in financial engineering."

Paul Glasserman, Monte Carlo Methods in Financial Engineering, Springer, 2003.



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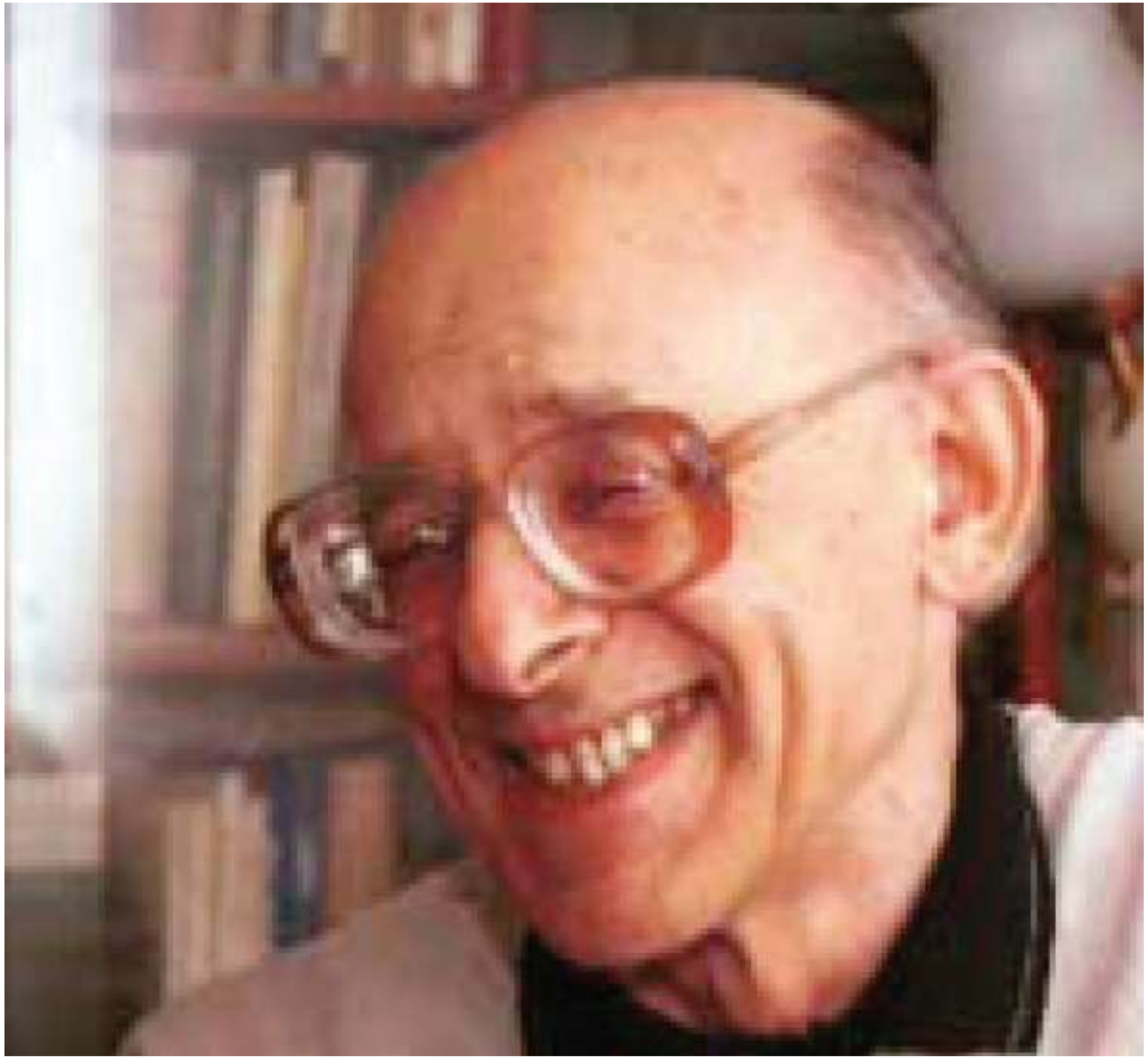

A TEST FUNCTION

In the n-dimensional unit cube consider the function

$$f = \prod_{i=1}^{n} g_i(x_i),$$

where $g_i(x) = \frac{|4x-2| + a_i}{1+a_i}$, $a_i \geq 0$ – a parameter

1. For all these functions $\int_0^1 g_i(x)dx = 1$ and therefore

$$\int_0^1 \cdots \int_0^1 f \, dx_1 \dots dx_n = 1$$

2. The variation of the function $g_i(x)$ is

$$1 - \frac{1}{1+a_i} \leq g_i(x) \leq 1 + \frac{1}{1+a_i}.$$

Therefore, the parameter a_i can be used for specifying the