The Legacy of A. M. Lyapunov to Systems and Control Theory
110 years of the Toulouse edition "The general problem of the stability of motion"

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> It is useful occasionally to look at the past to gain a perspective on the present
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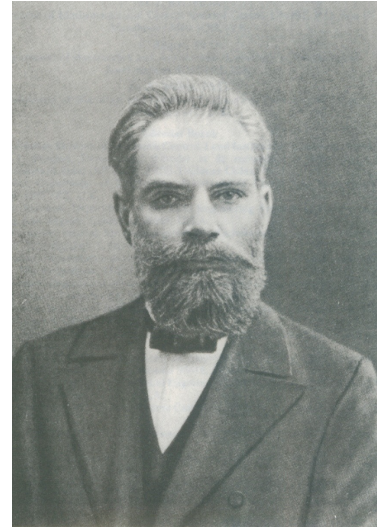> —————————————————
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> F. Linden

Abstract

Three significant dates relating to A. M. Lyapunov will be celebrated in 2017: the 160th anniversary of his birth, 125 years since the first publication of his seminal memoir "Obshchaya zadacha ob ustoichivosti dvizheniya" (The general problem of the stability of motion) printed in Russian by the Mathematical Society of Kharkov, and 110 years since the appearance of the French translation of his work published in the Annales de la Faculté des Sciences de l'Université de Toulouse.

This open track is dedicated to the impact of Lyapunov's ideas on the modern control theory. It offers an opportunity to the new generations of control scientists to discover the history of Lyapunov's framework and people that played a major role in its development.

The topics of this open track cover, but are not limited to:

- historical overviews of key personalities and groups in control connected with development of Lyapunov ideas;

- evolution of Lyapunov stability theory and its application in control engineering;

- recent trends in Lyapunov stability theory and its applications in systems analysis and control design;

- perspectives: open questions in the development of Lyapunov's framework and new challenges posed by emergent applications.

A. M. Lyapunov (1857–1918)

IFAC Technical Committees for evaluation: TC 2.3. (Non-Linear Control Systems) and TC 9.4 (Control Education)

Detailed description

Three significant dates relating to A.M. Lyapunov will be celebrated in 2017. The first one is 160th anniversary of his birth. Lyapunov's ideas and methods form the backbone of the control theory. Indeed, it is impossible to imagine modern control theory without such notions as "Lyapunov stability", "Lyapunov function" or "Lyapunov exponent". Also, the year 2017 marks 125 years since the first publication of his seminal memoir "Obshchaya zadacha ob ustoichivosti dvizheniya" (The general problem of the stability of motion) printed in Russian by the Mathematical Society of Kharkov, and 110 years since the appearance

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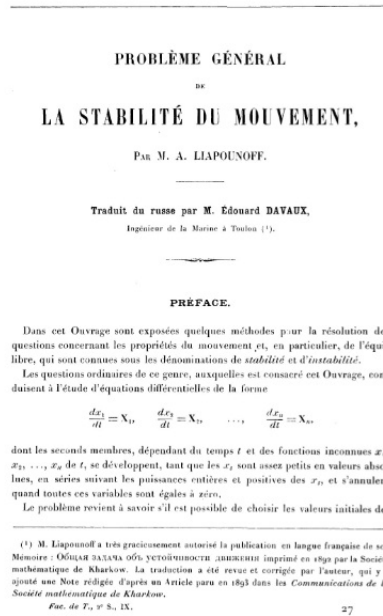
of the French translation of his work published in the Annales de la Faculté des Sciences de l'Université de Toulouse. This translation was performed by Édouard Davaux, Marine Engineer from Toulon, Lyapunov personally reviewed and corrected the French version, introducing some additional material. During the last centenary Lyapunov's framework of stability analysis not only became a cornerstone for all major control techniques but also served as a basis for analysis and control of system's behaviour in various disciplines.

The forecoming IFAC Congress in Toulouse provides us with the appropriate forum to recapitulate the impact of Lyapunov's ideas on the maturation of modern control theory and, at the same time, to counterpoint Lyapunov theory to the new challenges imposed by the emergent applications stemming from biology, medicine, economics to name a few.

Furthermore, this open track shall offer an opportunity to the new generations of control scientists to discover the history of Lyapunov's framework and people that played a major role in its development.

The topics of this open track cover, but are not limited to:

French edition of Lyapunov's Memoir

- historical overviews of key personalities and groups in control connected with development of Lyapunov ideas;

- evolution of Lyapunov stability theory and its application in control engineering;

- recent trends in Lyapunov stability theory and its applications in systems analysis and control design;

- perspectives: open questions in the development of Lyapunov's framework and new challenges posed by emergent applications.