Rectifiable oscillations in ordinary differential equations.
Part 1: motivation for a study

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Abstract. A new kind of geometric oscillations near $x = 0$ of all solutions $y(x)$ of the second-order linear differential equations has been recently introduced in the works by Mervan Pašić and James S. W. Wong published in 2007 year. Besides the infinitely many zeros of $y(x)$ near $x = 0$, this kind of oscillations gives the information on the finite and infinite length of the graph $G(y)$ of $y(x)$: if the length of $G(y)$ is finite (resp. infinite), then it is said that $y(x)$ is rectifiable (resp. unrectifiable) oscillatory near $x = 0$. In this lecture, we explain why this kind of oscillations are introduced and where one can find it in the nature? For a good understanding of this lecture, only an elementary knowledge from the Mathematical analysis of real functions are proposed.