

# A Filippov-type lemma for Stieltjes differential inclusions through viability

Bianca Satco

Stefan cel Mare University of Suceava, Romania

**Abstract.** The aim of the talk is to present a Filippov-type lemma for differential inclusions involving the Stieltjes derivative ([1]) with respect to a left-continuous non-decreasing function  $g : [0, 1] \rightarrow \mathbb{R}$ .

This is a consequence of a viability result established in a joint paper with prof. George Smyrlis ([2]) for such differential inclusions with time dependent state constraints

$$\begin{cases} x'_g(t) \in F(t, x(t)), \mu_g - a.e. t \in [0, 1) \\ x(t) \in K(t), \forall t \in [0, 1] \\ x(0) = x_0 \in K(0). \end{cases}$$

## References

- [1] R.L. Pouso, A. Rodriguez, A new unification of continuous, discrete, and impulsive calculus through Stieltjes derivatives, *Real Anal. Exch.*, 40(2015) 319–353.
- [2] B. Satco, G. Smyrlis, Viability and Filippov-type lemma for Stieltjes differential inclusions, *Set-Valued and Variational Analysis* 31(3), 2023.