1164-34-192 **Sebastián Buedo-Fernández*** (sebastian.buedo@usc.es), Departamento de Estatística, Análise Matemática e Optimización and Instituto de Matemáticas, Facultade de Matemáticas, 15782 Stgo. de Compostela, Spain. *An application of discrete dynamics to the study of Mackey-Glass type delay differential equations: from one to higher dimensions.*

When modeling phenomena that involve destruction and delayed production of a certain quantity, the so-called Mackey-Glass type delay differential equations have been widely considered. They have a linear decay term and a delayed feedback such as in

$$x'(t) = -x(t) + f(x(t-\tau)), \tag{1}$$

with $\tau > 0$ and $f : \mathbb{R} \to \mathbb{R}$ being a continuous function.

Several works have shown how some information about the qualitative behavior of the solutions of equation (1) can be obtained through the study of the difference equation

$$x_{n+1} = f(x_n). \tag{2}$$

In particular, if equation (2) has a unique equilibrium and it is an attractor for a compact interval I such that $f(I) \subset I$, then the unique equilibrium of equation (1) is also an attractor for a certain subset of the phase space. Thus, one may use some known techniques of scalar discrete dynamics to study equation (1).

In this talk, we will recall some details of this theory, including one way to generalize these ideas to certain systems of delay differential equations. Then, we will explain how far we were able to go regarding this type of extension by using a concept of attraction based on compact and convex sets. (Received January 18, 2021)