Extensions of weak continuous selections

Given \((X, \tau)\) and \(m \in \omega\), an \(m\)-continuous selection \(f : [X]^{\leq m} \to X\) is a choice function which is continuous with respect to the Vietoris topology.

The study of continuous selections began with Ernest Michael in a paper published in 1951. In 1981, J. v. Mill and E. Wattel proved that for compact spaces \((X, \tau)\), it is equivalent the existence of a 2-continuous selection on \(X\) and the existence of a total order on \(X\) which is compatible with \(\tau\). In 2009, M. Hrusak and I. Martínez Ruiz constructed a \(\Psi\)-space which admits a 2-continuous selection but it’s not weakly orderable. They asked if every space which admits a 2-continuous, admits a 3-continuous selection, question that was independently asked by V. Gutev. A more general question was then stated.

**Question 1.** If a space \((X, \tau)\) admits a \(m\)-continuous selection, is it true that \(X\) admits a \(m+1\)-continuous selection?

In this talk we give a partial answer to that question, showing a relation between prime numbers and the existence of \(n\)-continuous selections.