My research area is the part of algebraic topology that is called *topological fixed point theory*, a broad subject that has substantial interactions with several branches of mathematics as well as with other parts of topology. Fixed point theory is the study of solutions to the equation $f(x) = x$ for a map, that is, a continuous function, f of a space to itself. My specialty is *Nielsen theory*, named in honor of Jakob Nielsen who, in the 1920's, introduced the basic concepts, now called Nielsen numbers, which are lower bounds for the number of solutions to fixed point and other related equations, among maps homotopic to the given map. One such related topic is *coincidence theory* which is concerned with solutions to the equation $f(x) = g(x)$ for maps f and g.

I have devoted most of my more recent research to studying the Nielsen theory of a class of multiple-valued functions called *n-valued maps.* A fixed point of a multiple-valued map f means that x belongs to the set $f(x)$. The general fixed point theory of such functions is a big enough subject to merit a 400-page book by Lech Gorniewicz that was published in 1999. On the other hand, their Nielsen theory is quite undeveloped: most of what was known about it in the 20th century I summarize in a few pages of the Handbook of Topological Fixed Point Theory (Springer, 2005, pages 440 - 444). An *n-valued map* is a map from a space to itself that associate to each point an unordered set of exactly n points. For an important example, viewing the unit circle S^1 as the set of complex numbers of norm one we define an n-valued map by sending each point of S^1 to its set of n-th roots. The function is continuous because nearby points of S^1 have nearby n-th roots. With this motivation, Helga Schirmer introduced the Nielsen theory of n-valued maps in 1984 - 5 and developed its geometric features for such maps of manifolds. Her main result was later generalized to the appropriate class of finite polyhedra by my former student Joel Better.

Since my initial paper on this subject, published in 2004, I have published a number of papers that further develop the Nielsen theory of n-valued maps, several of them co-authored by undergraduates. I showed that n-valued maps arise naturally in the many topological settings that involve finite covering spaces. I found methods for computing the Nielsen numbers of n-valued maps. In particular, I showed that the n-valued Nielsen number can be calculated by computing the Nielsen coincidence number of certain *single-valued* functions. A consequence was a formula for the Nielsen numbers of an interesting class of n-valued maps of tori.

Extending Nielsen theory from single-valued to n-valued maps is, in general, far from a routine exercise. For that reason, and because n-valued maps offer a rich collection of interesting examples as well as some very challenging problems, the subject has attracted the attention of several fixed point theorists.