Let K be a field and $(f_1, \ldots, f_n) \subset K[X_1, \ldots, X_n]$ be a sequence of quasi-homogeneous polynomials of respective weighted degrees $(d_1, \ldots, d_n)$. By this, we mean that there exists $(w_1, \ldots, w_n) \in \mathbb{Z}_{>0}^n$ s.t. for any $1 \leq j \leq n$, the polynomial $f_i(X_1^{w_1}, \ldots, X_n^{w_n})$ is homogeneous and has degree d_i.

In this talk, we show how we can adapt the existing strategies for homogeneous systems to quasi-homogeneous systems. We also show that for generic quasi-homogeneous systems, the complexity of a Gröbner basis computation for a quasi-homogeneous system is polynomial in the weighted Bézout bound $\prod_{i=1}^{n} \frac{d_i}{w_i}$.

Joint work with Jean-Charles Faugère and Mohab Safey El Din