**Abstract**

Consider the gradient map associated to any non-constant homogeneous polynomial $f \in \mathbb{C}[x_0, \ldots, x_n]$ of degree $d$, defined by

$$\phi_f = grad(f) \colon D(f) \to \mathbb{P}^n, (x_0 \colon \ldots \colon x_n) \to (f_0(x) \colon \ldots \colon f_n(x))$$

where $D(f) = \{x \in \mathbb{P}^n; f(x) \neq 0\}$ is the principal open set associated to f and $f_i = \frac{\partial f}{\partial x_i}$. This map corresponds to polar Cremona transformations.

In section 1.4 we give a new lower bound for the degree d(f) of $\phi_f$ under the assumption that the projective hypersurface V : f = 0 has only isolated singularities. When d(f) = 1, our main result of this thesis, in section 1.5, yields extremely strong conditions on the monodromy operators associated to the singularities of V.

In section 3.4 we show that two homogeneous polynomials f and g having isomor phic Milnor algebras have equivalent gradient mappings $\phi_f$ and $\phi_g$.