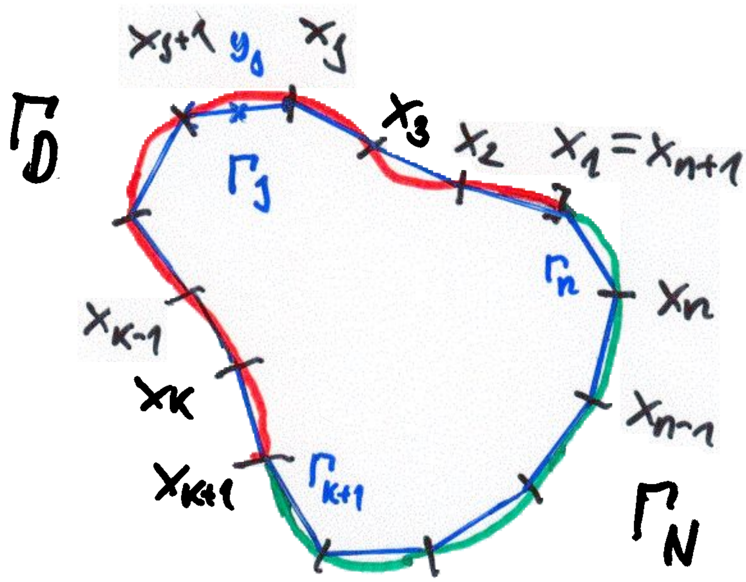
Discretization of the boundary:

$\Gamma = \Gamma_D \cup \Gamma_N \approx \Gamma_h = \Gamma_{Dh} \cup \Gamma_{Nh}$

Let us choose n different nodes $x_1, \dots, x_n$ on the boundary Γ of the domain Ω:



$x_i \neq x_j \ \forall i \neq j$

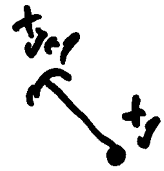
$x_1, \dots, x_k \in \Gamma_D$

$x_{k+1}, \dots, x_n \in \overline{\Gamma}_N$

$x_{n+1} = x_1$ (periodic)

$\Gamma_j = \{x = x_j + t(x_{j+1} - x_j) \in \mathbb{R}^2 : 0 \leq t < 1\} = \Gamma_{hj}$

$= j$th boundary piece



$h_j = |\Gamma_j| = |x_{j+1} - x_j| = j$th step size,

$\Gamma_h = \bigcup_{j=1}^{n} \Gamma_j = \bigcup_{j=1}^{n} \Gamma_{hj}$,

$\Gamma_D \approx \Gamma_{Dh} = \bigcup_{j=1}^{k} \Gamma_j$

$\Gamma_N \approx \Gamma_{Nh} = \bigcup_{j=k+1}^{n} \Gamma_j$

$y_j = x_j + \frac{1}{2}(x_{j+1} - x_j)$