

$$\begin{array}{ccc}
 U \cap N & \hookrightarrow & U \\
 \downarrow & & \downarrow \\
 h|_{U \cap N} & & h \\
 \downarrow & & \downarrow \\
 U \cap \mathbb{R}^k & \longrightarrow & V \\
 \cap & & \cap \\
 \mathbb{R}^k & & \mathbb{R}^k \times \mathbb{R}^{n-k}
 \end{array}$$