

points on  $S$ . We will do this first by an Euler characteristic argument, as follows: Let  $\{H_\lambda\}$  be a generic pencil of hyperplanes in  $\mathbb{P}^3$  — specially, one such that for each  $p \in R$ ,  $p$  lies on a unique  $H_\lambda$  and  $H_\lambda$  is generic among hyperplanes containing  $p$ ; and such that the pencil  $\{H_\lambda \cap S\}$  is Lefschetz on  $S-R$ .

□ Choose generic hyperplanes  $H_1$  &  $H_2$  s.t.  $H_i \not\supset p$ , for all  $p \in R$ .  $\Rightarrow \{H_1 + \lambda H_2\}$  has a unique element  $H_\lambda$  containing  $p$ , for each  $p \in R$ .

I can not assure myself that for a generic pencil  $\{H_\lambda\}$ ,  $\{H_\lambda \cap S\}$  is Lefschetz on  $S-R$ .

But I can get some idea as follows: For a plane curve  $C$ , the condition that  $C$  has one double point as the only singularity is the weakest one. .... Pathological ....

In some sense, Lefschetz pencil is generic.

□

Let

$$\{C_\lambda = \pi^{-1}(H_\lambda)\}$$

be the corresponding pencil of curves on  $\Sigma$ .

□

$$\pi: \Sigma \longrightarrow S \xrightarrow{[\eta]} \sigma_1, \sigma_2 \Rightarrow \pi^*\sigma_1 \text{ \& \; } \pi^*\sigma_2 \text{ form a pencil on } \Sigma. \quad \square$$