# Supplemental Material for Active Learning based on Locally Linear Reconstruction

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## Appendix A
## Proof of the Equation (22)

**Following the Sherman-Morrison-Woodbury formula, we have**

$$
\begin{aligned}
&(\mu M - n - i)^{-1} \\
=&(\mu M - n - \mathbf{e}_i\mathbf{e}_i^T)^{-1} \\
=&(\mu M - n)^{-1} - \frac{(\mu M - n)^{-1}\mathbf{e}_i\mathbf{e}_i^T(\mu M - n)^{-1}}{1 - \mathbf{e}_i^T(\mu M - n)^{-1}\mathbf{e}_i} \\
=&H - \frac{H\mathbf{e}_i\mathbf{e}_i^T H}{1 - \mathbf{e}_i^T H\mathbf{e}_i} \\
=&H - \frac{H_{*i}H_{i*}}{1 - H_{ii}}
\end{aligned}
\tag{1}
$$

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