Since the refracted ray should be in the same plane as the incident ray and the normal we should be able to express it as:

$$\hat{r}_r = \alpha\hat{n} + \beta\hat{r}_i$$

α and β can be obtained from the noting that $\hat{r}_i$ is a unit vector and Snell's law:

$$\begin{aligned}\hat{r}_i \cdot \hat{r}_i &= 1\\ (\alpha\hat{n} + \beta\hat{r}_i)\cdot(\alpha\hat{n} + \beta\hat{r}_i) &= 1\\ \alpha^2 + \beta^2 + 2\alpha\beta(\hat{n}\cdot\hat{r}_i) &= 1\end{aligned}$$

and from Snell

$$n_i \sin\theta_i = n_r \sin\theta_r \Rightarrow \theta_r = \arcsin\left(\frac{n_i}{n_r}\sin\theta_i\right)$$

where

$$\begin{aligned}\cos\theta_i &= -\hat{n}\cdot\hat{r}_i\\ \theta_i &= \arccos\left(-\hat{n}\cdot\hat{r}_i\right)\end{aligned}$$

And the expression for the angle on the refracted side:

$$\begin{aligned}-\hat{n}\cdot\hat{r}_r &= \cos\theta_r\\ (-\hat{n})\cdot(\alpha\hat{n} + \beta\hat{r}_i) &= \cos\theta_r\\ -\alpha - \beta(\hat{n}\cdot\hat{r}_i) &= \cos\theta_r\\ \alpha &= -\cos\theta_r - \beta(n\cdot r_i)\end{aligned}$$

replacing this in the first equation

$$(-\cos\theta_r - \beta(\hat{n}\cdot\hat{r}_i))^2 + \beta^2 + 2(-\cos\theta_r - \beta(\hat{n}\cdot\hat{r}_i))\beta(\hat{n}\cdot\hat{r}_i) = 1$$

$$(1 - (\hat{n}\cdot\hat{r}_i)^2)\beta^2 = 1 - \cos^2\theta_r$$

$$\beta = +\sqrt{\frac{1-\cos^2\theta_r}{1-(\hat{n}\cdot\hat{r}_i)^2}} = \frac{\sin\theta_r}{\sin\theta_i}$$

So that $\hat{r}_r$ can be expressed as:

$$\hat{r}_r = \left(-\cos\theta_r + \left(\frac{\sin\theta_r}{\sin\theta_i}\right)\cos\theta_i\right)\hat{n} + \frac{\sin\theta_r}{\sin\theta_i}\hat{r}_i$$