Erratum


I am grateful to Taner Buyukkoroglu for raising the following points:

First, there is an ambiguity in the definition of matrix $H$. The reader may understand that matrices $H_{ij} \in \mathbb{R}^{n \times n}$, $i, j = 0, \ldots, n$ constitute a block partitioning of matrix $H \in \mathbb{R}^{n(n+1) \times n(n+1)}$. However, this is not correct. Denoting a block partitioning of $H$ by $H_{ij} \in \mathbb{R}^{(n+1) \times (n+1)}$, and the $(i, j)$ entry in matrix $H(x)$ by $[H(x)]_{ij}$, the following identity holds

$$x' H_{ij} x = [H(x)]_{ij}, \quad i, j = 1, \ldots, n.$$ 

Second, some matrix dimensions are inconsistent in the proof of the main result. Indeed, the sequence leading to the implication that $H(x) \succ 0$ for all vectors $x$ such that $P(x) \geq 0$ should be written

$$(I_n \otimes x)'(D \otimes I_{n+1})H(I_n \otimes x) = (D \otimes x')H(I_n \otimes x) = DH(x) \succ (I_n \otimes x)'(I_n \otimes P + G)(I_n \otimes x).$$

Then $H(x) \succ D^{-1} \otimes P(x)$ and the desired implication follows.