The total embedding distribution of a graph, including the non-orientable embeddings, is known for relatively few classes of graphs, compared to the genus distribution. A new usage of Chebyshev polynomials was found in the study of embedding distribution, using the overlap matrix, we obtain homogeneous (non-homogeneous) recurrence relation for rank distribution polynomial, which can be solved in terms of Chebyshev polynomials of the second kind. The explicit formula for embedding distribution of some well-known classes of graphs are obtained. A splitting theorem for embedding distributions is obtained and was used to calculate embedding distribution of generalized fan graphs. (Received September 08, 2011)