
Algorithm 1 Construct CTI_SyscallSynonymBase

Input SyscallList[] /* a list of 354 linux syscall names (1-D array) */
Output SynonymList[] /* a table presenting SynonymBase (n-D array) */

Initialize *SynonymList* \leftarrow []

Initialize *PairList* \leftarrow []

for *thisSyscall* in *SyscallList* **do**

/* Search for manual webpage for each system call */

/* Get the sections of manual webpage */

manpage \leftarrow crawl_web_content(url, *this_syscall*)

nameSector \leftarrow extract(*manpage*)

descriptionSector \leftarrow extract(*manpage*)

end for

/* Extract and store the verb-object phrase pair from manual */

for *sector* in [*nameSector*, *descriptionSector*] **do**

verbList \leftarrow find_verb_phrase_in_sentence(*sector*) // by DP

objectList \leftarrow find_object_phrase_in_sentence(*sector*) // by expert

pairs \leftarrow construct_pairs(*verbList*, *objectList*, *sector*)

extend list *pairs* to *PairList*

end for

/* Construct CTI_SyscallSynonymBase */

Initialize *rowData* \leftarrow []

for (*syscall*, *verb*, *object*) in *PairList* **do**

rowData.syscall \leftarrow *syscall*

rowData.enVerb \leftarrow *verb*

rowData.object \leftarrow *object*

rowData.sentence \leftarrow *descriptionSent*

// We assign entity and action type for every syscall

rowData.entityType \leftarrow classify_object_entity(*syscall*, *object*)

rowData.actionType \leftarrow classify_syscall(*syscall*)

// Obtain word vector for the 'verb' in sentence

rowData.wordvector \leftarrow bert_embedding(*descriptionSent*, *verb*)

append *rowData* to *SynonymList*

end for

return *SynonymList*
