

# Brief Intro and Install Info for jvsipNumpy

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March 20, 2025

## 1 About

The **VSIPL** project is all about a numerical library for signal processing. For **python** the de facto standard for doing similar calculations is the **numpy** module. The purpose for writing the **jvsipNumpy** module is to provide a means to enable copies from-and-to **numpy** arrays; and to-and-from **pyJvsip** arrays. The only precisions supported at this time are float and double; both complex and real.

### 1.1 Methods

To try for a little performance we write C code for the various needed copy functions. These are the **numpyArrayCopies.c** and **numpyArrayCopies.h** files. The header file includes needed **python** and **numpy** header files. You must have these headers on your system somewhere.

To wrap the code for compiling into a **python** module we include the **jvsipNumpyUtils.i** file. This file is needed by **SWIG** to generate the **jvsipNumpyUtils\_wrap.c** file and the **jvsipNumpyUtils.py** module file.

The **jvsipNumpy.py** file uses the **jvsipNumpyUtils** module and defines two functions. The first is **jvToNp** which takes a **pyJvsip** matrix or vector object and returns the equivalent **numpy** object. The second is **npToJv** which takes a **numpy** array and returns the equivalent **pyJvsip** object.

### 1.2 Make and Install

Before making **jvsipNumpy** you should have already made and installed the **vsip** module and the **pyJvsip** module.

To create the **jvsipNumpyUtils** module you must first use **swig** and the **jvsipNumpyUtils.i** file to create the wrapper code.

```
swig -python jvsipNumpyUtils.i
```

Once you have the wrapper code you should use **python** and **pip** to install it. From inside the **c\_numpy\_src** directory do

```
python3 -m pip install .
```

Don't forget the period at the end of the above command.

### 1.2.1 Additional Info

I have found **python** installation of modules to be somewhat finicky and dependent on the **python** installation. I am not a **python** expert. The commands above to install work on my macs using the Apple supplied **python3**. I also use these commands to install on a **raspberrypi** with is a **linux** distribution. The code should work anywhere with a **python** and **ANSI C** compiler (and **SWIG**) but the module create and install may be system dependent.