Lab 6 - Resampling
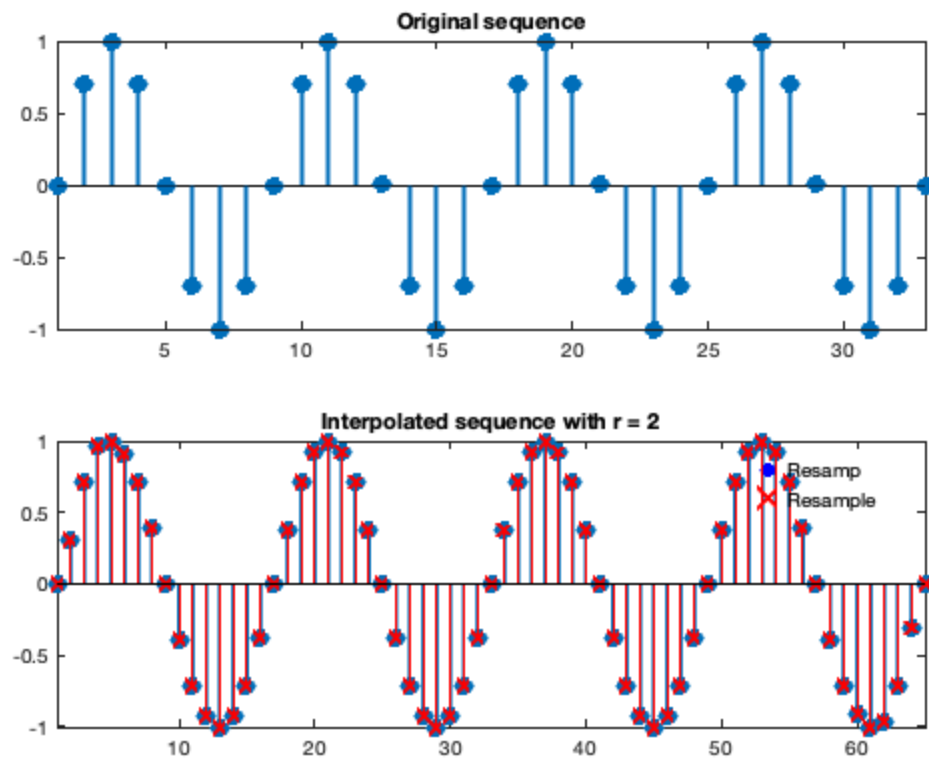
Table of Contents

Testing resampling of a sin at (5/2)fs

```
x = sin(2 * pi * (0:32) / 8);
test_resamp(x, 2.5);
```
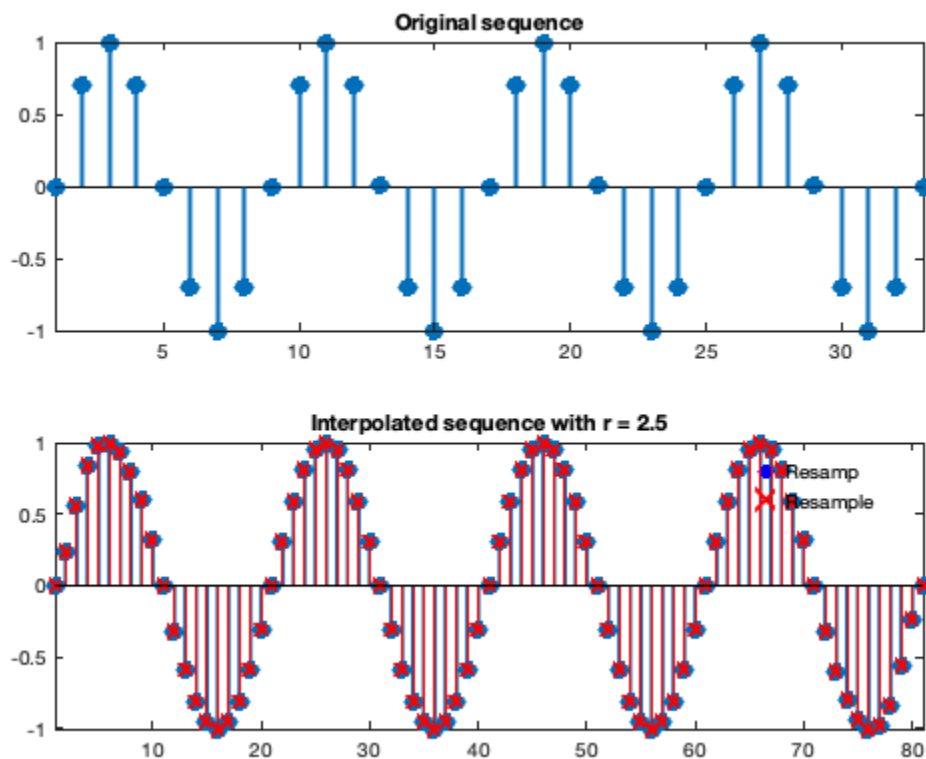

Testing resampling of a sin at 2fs

```
test_resamp(x, 2);
```

Original sequence

Interpolated sequence with r = 2

Testing resampling of a sin at (2/3)fs
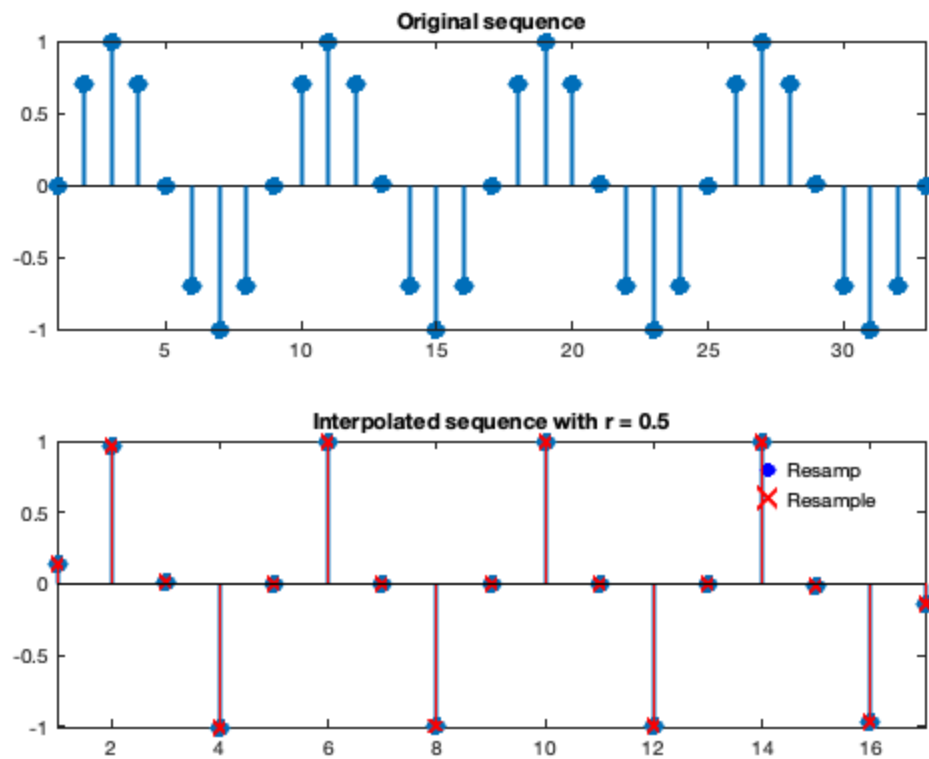
```
test_resamp(x, 0.666667);
```

Original sequence

Interpolated sequence with r = 0.66667
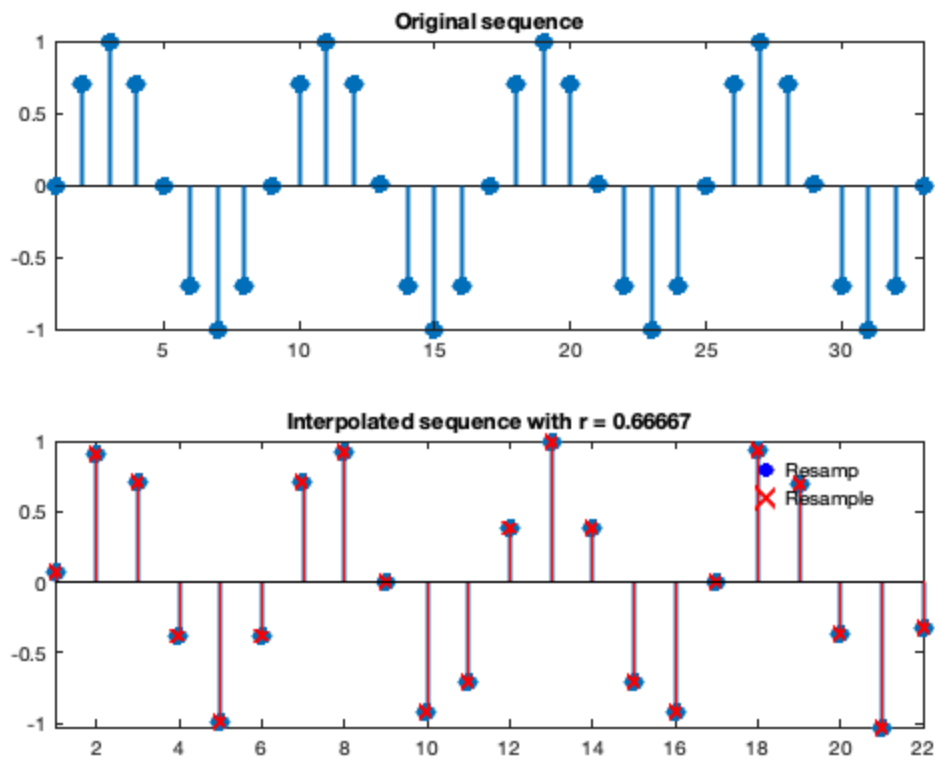
Testing resampling of a sin at (1/2)fs

```
test_resamp(x, 0.5);

% Make sure that you have the file 'seashell.wav' in your directory
[x, fs] = audioread('seashell.wav');
```
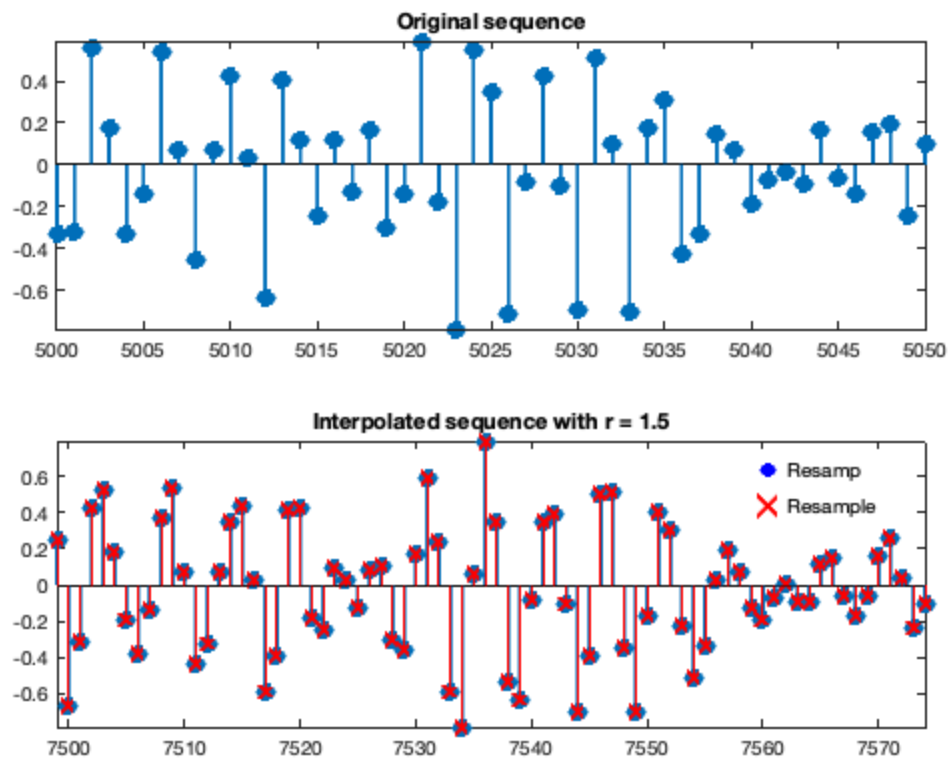
Original sequence

Interpolated sequence with r = 0.5

Testing resampling of 'seashell' at (3/2)fs

```
test_resamp(x, 1.5, 5000, 5050);
```

Original sequence

Interpolated sequence with r = 1.5

- Resamp
- Resample

Testing resampling of 'seashell' at (3/4s)fs

```
test_resamp(x, 0.75, 5000, 5050);
```

Original sequence

Interpolated sequence with r = 0.75
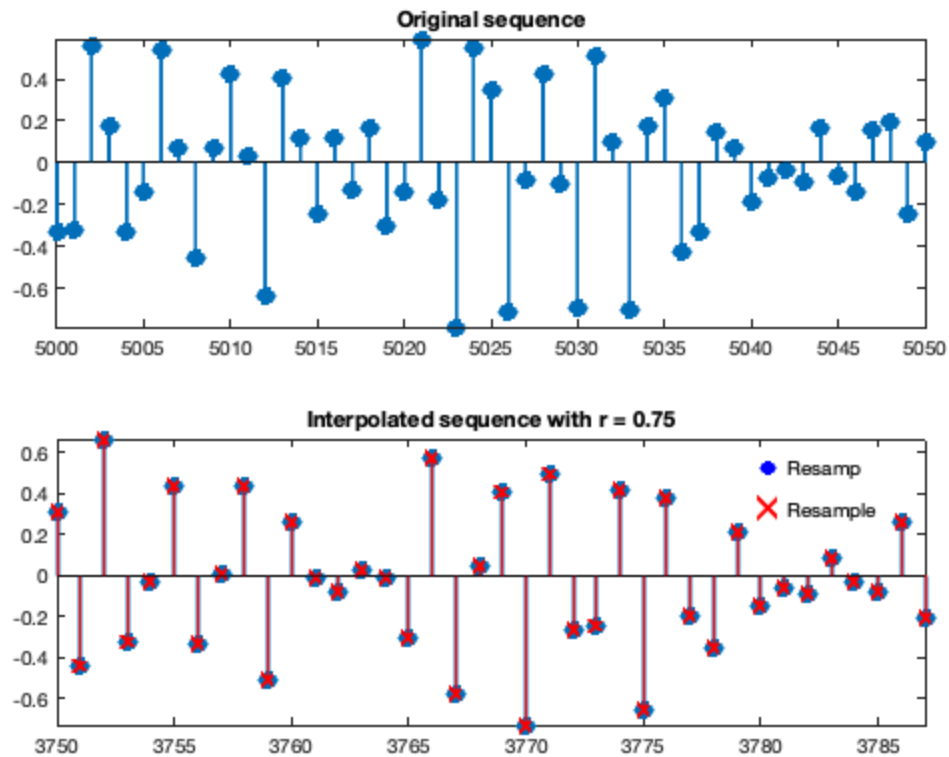
Print program

```
disp(' ')
disp('--- resamp.m -------------------------------')
type('resamp')


--- resamp.m ------------------------------

function y = resamp(x, r)
% RESAMP Resample an input sequence x by a factor of r
%    to produce an output sequence y by a combination
%    of upsampling and downsampling.
%    For example,    y = resamp(x,1.5);
%    will upsample x by 3 and downsample by 2.

[L,M] = rat(r);
lengthX = length(x);
upsampleX = zeros(1,lengthX*L);
upsampleX(1:L:end) = x;  %this calulates the upsample
wc = max(L,M);
fn = 1/wc;
n = round(1+20/fn);
h = L*fir1(n-1, fn, kaiser(n,5));
x_filt = conv(upsampleX, h, 'same');
y = x_filt(1:M:end);    %this calculates the downsample
```

```
end
```

Published with MATLAB® R2018b