SVDCompression

June 12, 2019

[1]:
```
library(imager)
```

```
Warning message:
"package 'imager' was built under R version 3.5.3"Loading required package:
magrittr
Warning message:
"package 'magrittr' was built under R version 3.5.3"
Attaching package: 'imager'

The following object is masked from 'package:magrittr':

    add

The following objects are masked from 'package:stats':

    convolve, spectrum

The following object is masked from 'package:graphics':

    frame

The following object is masked from 'package:base':

    save.image
```

[2]:
```
im <- load.image("image.jpg")
```

[3]:
```
plot(im)
```

[28]:
```
dim(im)
im.gray <- rowMeans(im, dims = 2)
```

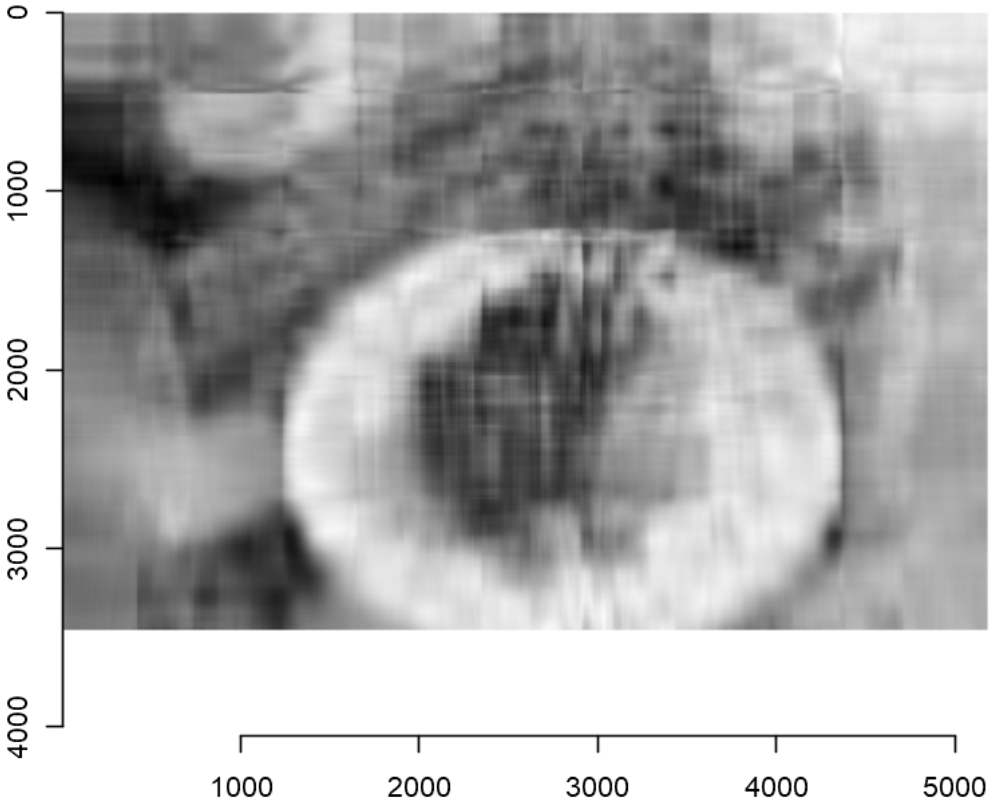
1. 5184 2. 3456 3. 1 4. 3

[29]:
```
svd <- svd(im.gray)
```

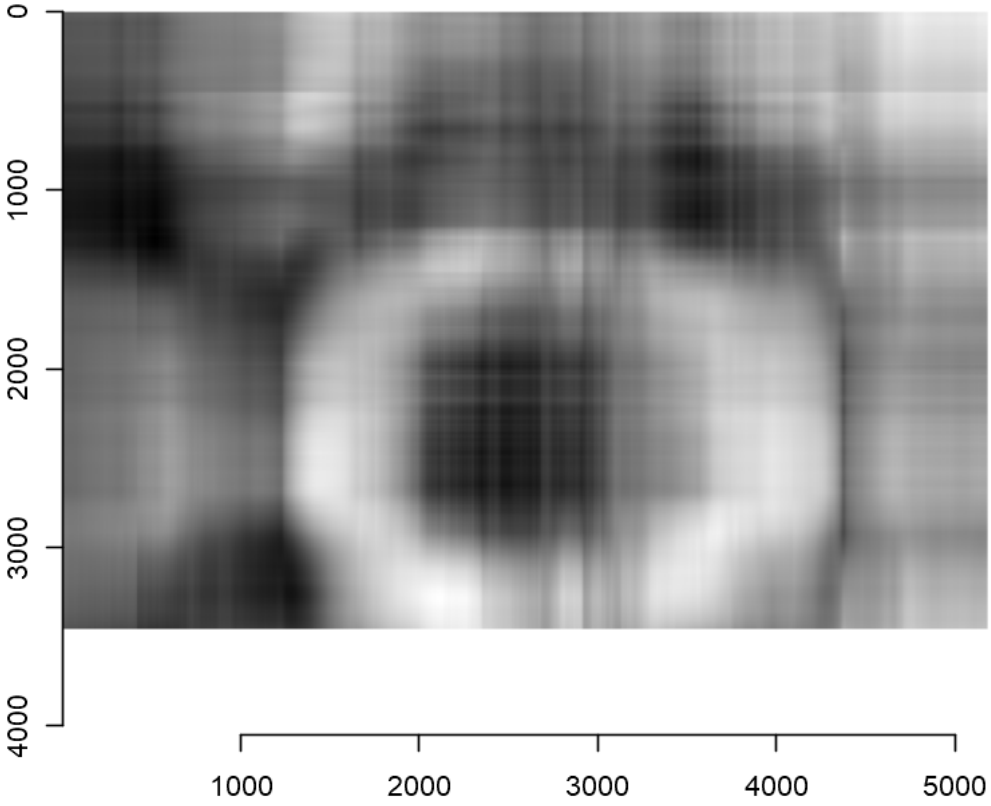
[30]:
```
d <- svd$d
u <- svd$u
v <- svd$v
```

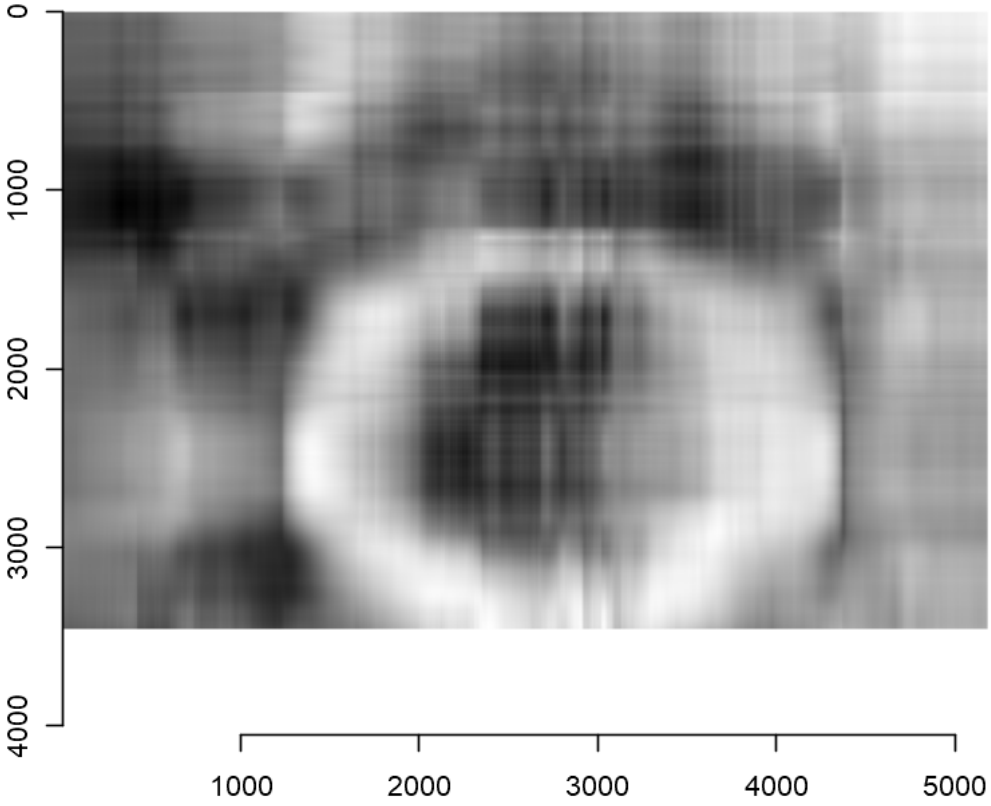
[31]:
```
composed = u %*% diag(d) %*% t(v)
plot(as.cimg(composed))
```

[32]:
```
composed = u[,1:10] %*% diag(d[1:10]) %*% t(v[,1:10])
plot(as.cimg(composed))
```



[34]:
```
for (i in c(3, 4, 5, 10, 20, 30))
{
        compressed <- u[,1:i] %*% diag(d[1:i]) %*% t(v[,1:i])
    plot(as.cimg(compressed))
}
```


0
1000
2000
3000
4000
1000
2000
3000
4000
5000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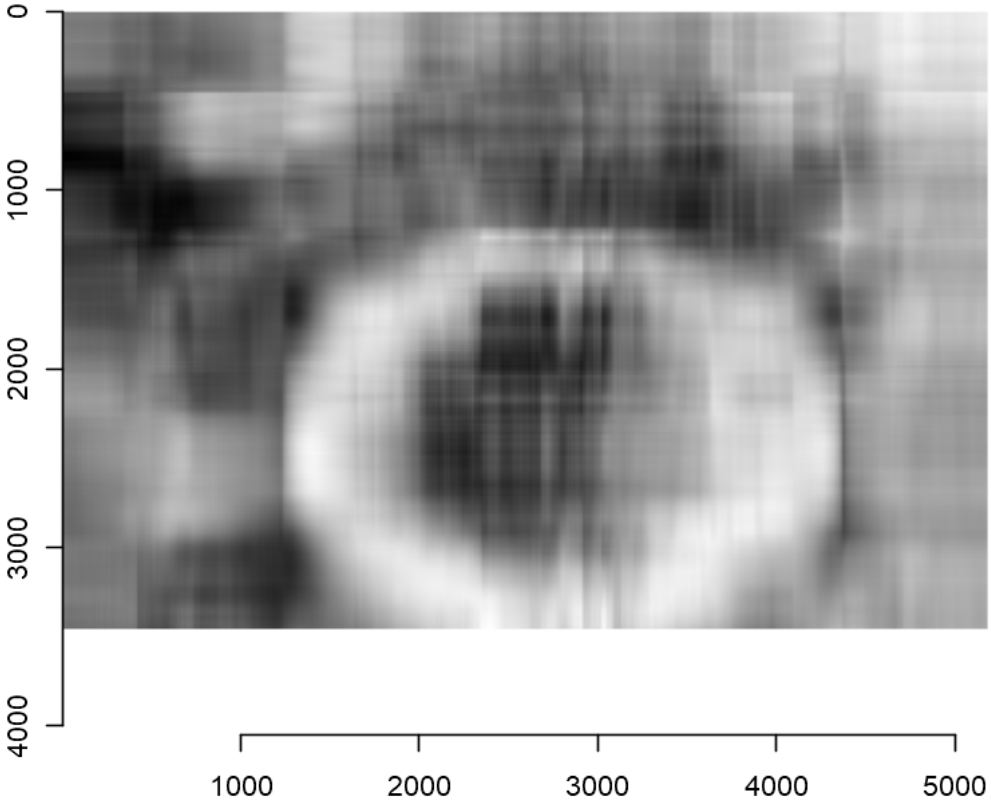
0
1000
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4000
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2000
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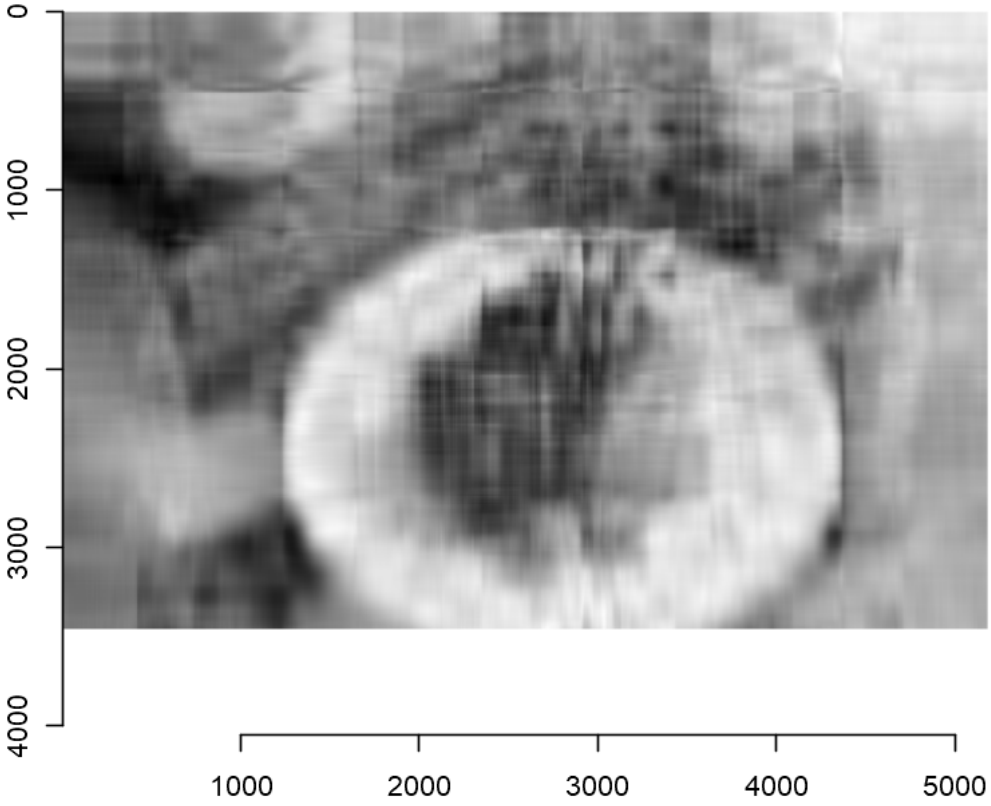
4000
5000


0
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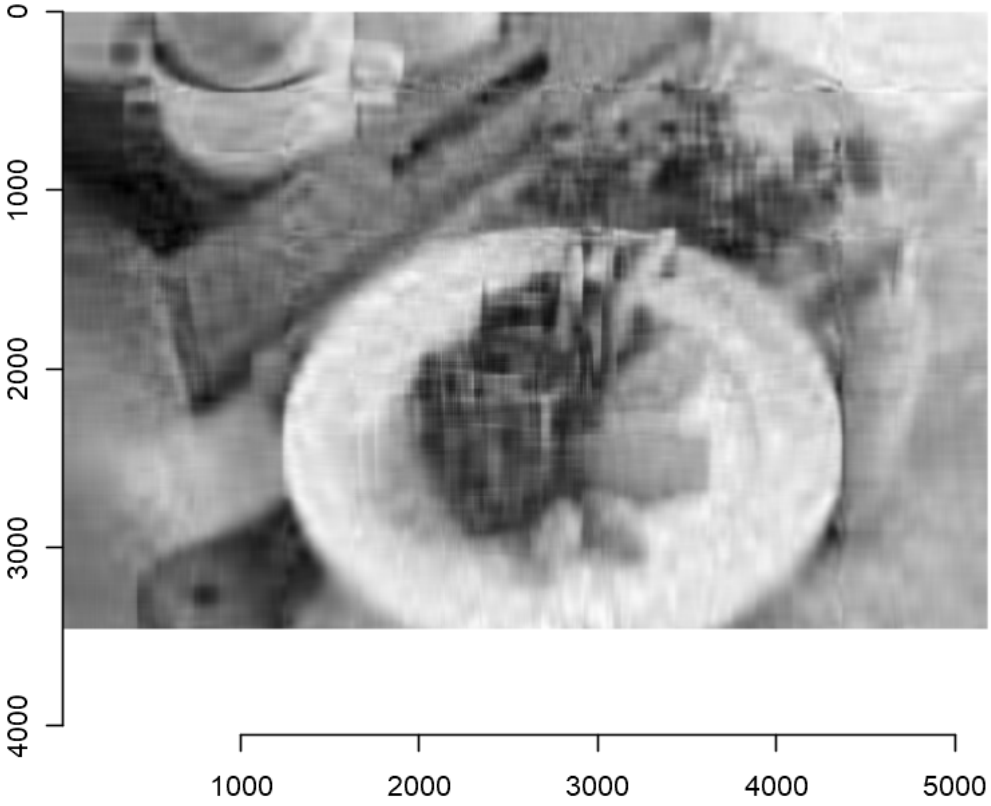
0
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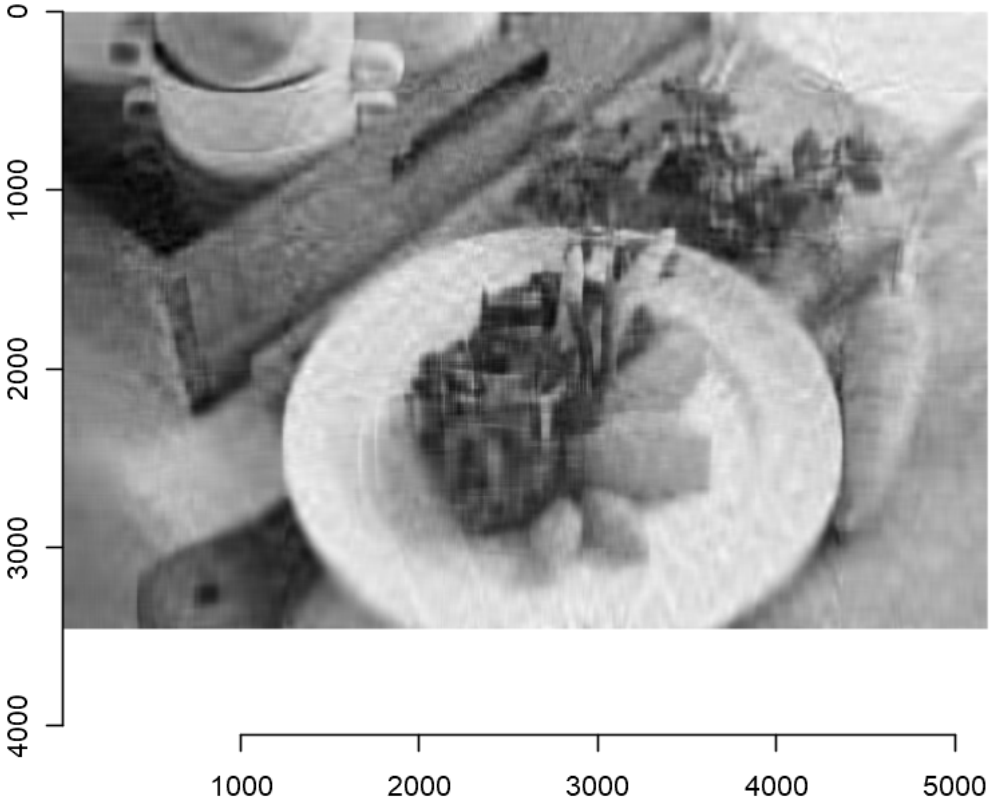
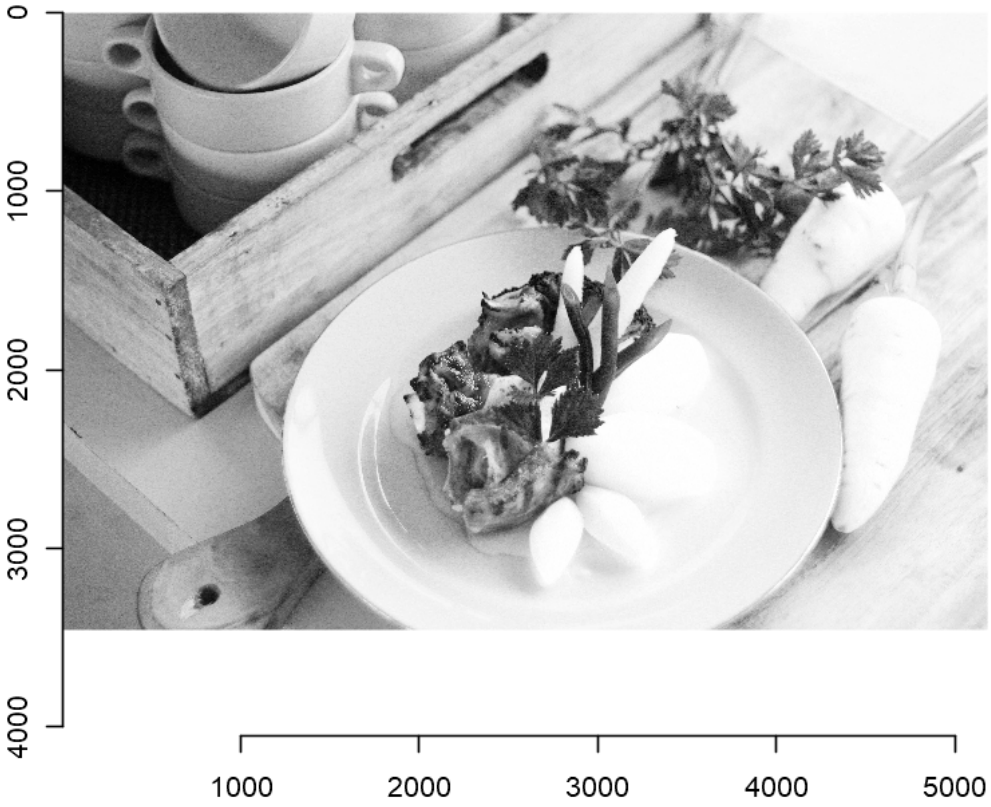


[14]:
```
r <- im[,,1]
```

[15]:
```
plot(as.cimg(r))
```



[16]:
```
?mean
```

meanArithmetic Meanmean mean.defaultmeanmean.default univarmean Generic function for the (trimmed) arithmetic mean.

```
mean(x, ...)

## Default S3 method:
mean(x, trim = 0, na.rm = FALSE, ...)
```

An object. Currently there are methods for numeric/logical vectors and dateDates, datetimedate.Rdash.time and time intervaltime interval objects. Complex vectors are allowed for trim = 0, only.

the fraction (0 to 0.5) of observations to be trimmed from each end of x before the mean is computed. Values of trim outside that range are taken as the nearest endpoint.

a logical value indicating whether NA values should be stripped before the computation proceeds.

further arguments passed to or from other methods. If trim is zero (the default), the arithmetic mean of the values in x is computed, as a numeric or complex vector of length one. If x is not logical (coerced to numeric), numeric (including integer) or complex, NA_real_ is returned, with a warning.

If trim is non-zero, a symmetrically trimmed mean is computed with a fraction of trim observations deleted from each end before the mean is computed. Becker, R. A., Chambers, J. M. and Wilks, A. R. (1988) *The New S Language*. Wadsworth & Brooks/Cole. weighted.meanweighted.mean, mean.POSIXctmean.POSIXct, colMeanscolMeans for row and column means. x <- c(0:10, 50) xm <- mean(x) c(xm, mean(x, trim = 0.10))