```r
# Plot PC loadings

library(lattice)
library(reshape2)

pc.load <- cbind(pc$loadings[, 1:channelCount])
colnames(pc.load) <- c("PC1", "PC2", "PC3", "PC4")
pc.df <- melt(pc.load)
xyplot(value ~ Var1, data = pc.df, group = Var2, type = "l",
       ylab = "PC Loadings", xlab = "Spectral Bands",
       auto.key = list(corner = c(0.98, 0.98), points = FALSE, lines = TRUE),
       panel = function(x, y, ...) {
    panel.grid(h = -1, v = -1)
    panel.xyplot(x, y, ...)
    panel.abline(h = 0, lty = "dashed")
})

# Plot variability for each principal component

PC1 <- (pc$sdev[1] ^ 2) * (pc$loadings[, 1] ^ 2) / diag(var(imageMatrix))
PC2 <- (pc$sdev[2] ^ 2) * (pc$loadings[, 2] ^ 2) / diag(var(imageMatrix))
PC3 <- (pc$sdev[3] ^ 2) * (pc$loadings[, 3] ^ 2) / diag(var(imageMatrix))
PC4 <- (pc$sdev[4] ^ 2) * (pc$loadings[, 4] ^ 2) / diag(var(imageMatrix))
PCSums <- PC1 + PC2 + PC3 + PC4
pcVar <- melt(cbind(PC1, PC2, PC3, PC4, "PC Sums" = PCSums))
xyplot(value ~ Var1, data = pcVar, group = Var2, type = "l",
       ylab = "Portion of Explained Variability", xlab = "Spectral Bands",
       auto.key = list(corner = c(0.45, 0.5), points = FALSE, lines = TRUE),
       panel = function(x, y, ...) {
    panel.grid(h = -1, v = -1)
    panel.xyplot(x, y, ...)
    panel.abline(h = 1, lty = "dashed")
})

# Calculate percentage of variability for each principal component

round((as.numeric(pc$sdev) ^ 2) / sum(as.numeric(pc$sdev) ^ 2) * 100, 3)

# [1] 97.435  1.854  0.507  0.203

# Scree plot

xyplot((pc$sdev ^ 2) ~ 1:channelCount, pch = 20, cex = 3, alpha = 0.75, type =
  "b",
       xlab = "Spectral Bands", ylab = "Eigenvalues",
       panel = function(x, y, ...) {
    panel.grid(h = -1, v = -1)
    panel.xyplot(x, y, ...)
})
```

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50