CLAIMS

1. A multifocal display device (100), comprising:

a display element (101) configured to generate an image with one or more colors,

a focus tunable lens (202),

a controller (102) configured to selectively tune the focus of the focus tunable lens (202) to a plurality of focal planes of different index during a frame period, and to one of the plurality of focal planes during a determined time period, and control the display element (101) according to a bit sequence (103) provided over the determined time period to generate the image, the bit sequence (103) including for each color a subsequence of bits of different significance,

wherein for each color, neither the first bit nor the last bit of the subsequence is the most significant bit of the subsequence.

2. The multifocal display device (100) according to claim 1, wherein the first bit and the last bit of the subsequence are the two least significant bits of the subsequence.

3. The multifocal display (100) device according to claim 2, wherein the subsequence increases monotonically in significance from the first bit to the most significant bit of the subsequence and decreases monotonically in significance from the most significant bit to the last bit of the subsequence.

4. A multifocal display device (100) according to claim 1, 2, or 3, wherein the one or more colors are two or more colors and their corresponding subsequences of bits are interleaved with each other.

5. The multifocal display device (100) according to any one of claims 1 to 4, wherein

the one or more colors include Green color and Red or Blue color, and the first bit or the last bit, or both the first bit and the last bit of the sequence (103) is for Red or Blue color.

6. The multifocal display device (100) according to any one of claims 1 to 5, wherein

even bits are arranged in the subsequence in an order reverse to an order of odd bits in the subsequence.

7. The multifocal display device (100) according to any one of claims 1 to 6, wherein

the controller (102) is configured to provide the bits of the bit sequence (103) at irregular intervals over the determined time period.

8. The multifocal display device (100) according to any one of claims 1 to 7, wherein

the controller (102) is configured to provide the bit sequence (103) offset in time from a start or an end of the determined time period.

9. The multifocal display device (100) according to any one of claims 1 to 8, further comprising:

a storage (700) storing a plurality of bit groups (701), the bit sequence (103) being a concatenation of these bit groups (701),

wherein the controller (102) is configured to control the display device (101) according to a first bit group (701b) during a first section of the determined time period, and according to a second bit group (701a) during a second section of the determined time period.

10. The multifocal display device (100) according to one of claims 1 to 9, wherein

the display element (101) comprises a Digital Micromirror Device, DMD (201), or a Liquid Crystal On Silicon, LCOS,

each bit of the bit sequence (103) determines an intensity of light for illuminating the DMD or the LCOS (201), and

a lower significant bit relates to a lower illumination intensity of the light.

11. The multifocal display device (100) according to claim 10, further comprising:

a color element (200) configured to provide the light for illuminating the DMD (201) or LCOS with different colors,

wherein each bit of the bit sequence (103) relates to a color provided to the light.

12. The multifocal display device (100) according to one of claims 1 to 11, wherein the bit sequence (103) includes at least 6 bits for each of a Red, Green and Blue color, in order to generate by the display element (101) an at least 18-bit color image.

13. The multifocal display device (100) according to one of claims 1 to 12, wherein the controller (102) is configured to control the display element (101) according to different bit sequences (103) in dependence of the focal plane index during the predetermined time period or in dependence of a focal plane index during a previous or next determined time period.

14. A method for providing a multifocal display, comprising steps of

selectively tuning a focus of a focus tunable lens (202) to a plurality of focal planes of different index during a frame period, and to one of the plurality of focal planes during a determined time period, and

controlling a display element (101) according to a bit sequence (103) provided over the determined time period to generate an image with one or more colors, the bit sequence (103) including for each color a subsequence of bits of different significance,

wherein for each color, neither the first bit nor the last bit of the subsequence for the respective color is the most significant bit of the subsequence.

15. A computer program product comprising a program code for controlling a multifocal display device according to one of claims 1 to 13.