

✓ Implementando o algoritmo para o método de segmentação Watershed.

```
# Importação das bibliotecas necessárias
import numpy as np
import matplotlib.pyplot as plt
from google.colab import files
from skimage import io, color
from skimage.segmentation import watershed, mark_boundaries
from skimage.feature import peak_local_max
from skimage.filters import sobel
from scipy import ndimage as ndi
import networkx as nx

def upload_image():
    """Solicita ao usuário o upload de uma imagem."""
    uploaded = files.upload()
    for filename in uploaded.keys():
        print(f"Arquivo {filename} carregado com sucesso!")
        return io.imread(filename)

def generate_segments_with_watershed(image):
    """
    Gera segmentos usando a técnica Watershed.

    Parâmetros:
    - image: Imagem de entrada.

    Retorna:
    - segments: Segmentação gerada.
    """
    # Converte a imagem para escala de cinza, se necessário
    if len(image.shape) == 3:
        image_gray = color.rgb2gray(image)
    else:
        image_gray = image

    # Aplica o gradiente (borda)
    gradient = sobel(image_gray)

    # Identifica máximos locais para Watershed
    local_maxi = peak_local_max(-gradient, footprint=np.ones((3, 3)), min_distance=20, labels=None)
    mask = np.zeros_like(image_gray, dtype=bool)
    mask[tuple(local_maxi.T)] = True # Converte coordenadas para uma máscara booleana

    # Gera os marcadores para Watershed
    markers, _ = ndi.label(mask)

    # Aplica o Watershed
    segments = watershed(gradient, markers)
    return segments

def build_rag_manual(image, segments):
    """
    Constrói o Region Adjacency Graph (RAG) manualmente.

    Parâmetros:
    - image: Imagem de entrada.
    - segments: Segmentação gerada.

    Retorna:
    - G: Grafo construído.
    """
    G = nx.Graph()

    # Adiciona os nós ao grafo
    for region in np.unique(segments):
        G.add_node(region)

    # Identifica pixels vizinhos para adicionar arestas
    rows, cols = segments.shape
    for r in range(rows - 1):
        for c in range(cols - 1):
            current = segments[r, c]
            right = segments[r, c + 1]
            down = segments[r + 1, c]
            if current != right:
                G.add_edge(current, right)
            if current != down:
                G.add_edge(current, down)
```

```

        G.add_edge(current, down)
    return G

def visualize_all(image, segments, rag):
    """
    Exibe três imagens lado a lado:
    1. Segmentos sobrepostos à imagem original.
    2. RAG sobreposto à imagem original.
    3. Segmentos e RAG sobrepostos à imagem original.

    Parâmetros:
    - image: Imagem de entrada.
    - segments: Segmentação gerada.
    - rag: Grafo de Adjacência da Região (RAG).
    """
    fig, ax = plt.subplots(1, 3, figsize=(30, 10))

    # Segmentos sobrepostos
    ax[0].imshow(mark_boundaries(image, segments))
    ax[0].set_title("Segmentos Sobrepostos")
    ax[0].axis("off")

    # RAG sobreposto à imagem
    ax[1].imshow(image)
    pos = {}
    for region in np.unique(segments):
        mask = segments == region
        y, x = np.mean(np.argwhere(mask), axis=0)
        pos[region] = (x, y)

    nx.draw(rag, pos, ax=ax[1], node_size=10, edge_color="yellow", node_color="red", with_labels=False)
    ax[1].set_title("RAG Sobreposto à Imagem")
    ax[1].axis("off")

    # Segmentos e RAG juntos
    ax[2].imshow(mark_boundaries(image, segments))
    nx.draw(rag, pos, ax=ax[2], node_size=10, edge_color="yellow", node_color="red", with_labels=False)
    ax[2].set_title("Segmentos e RAG Sobrepostos")
    ax[2].axis("off")

    plt.tight_layout()
    plt.show()

# Pipeline Principal
def main():
    print("Faça upload da imagem:")
    image = upload_image()

    # Garantir que a imagem seja RGB
    if len(image.shape) == 2 or image.shape[2] == 1:
        image = color.gray2rgb(image)


    # Geração de Segmentos
    print("Gerando segmentos com Watershed...")
    segments = generate_segments_with_watershed(image)

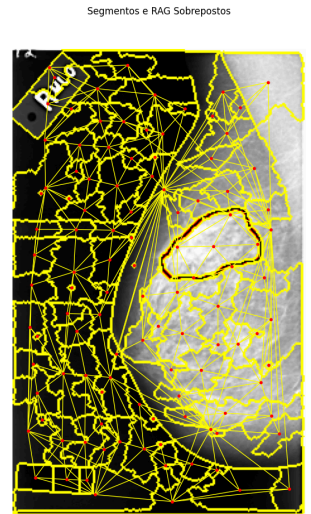
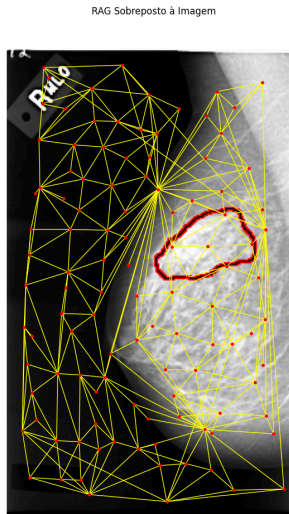
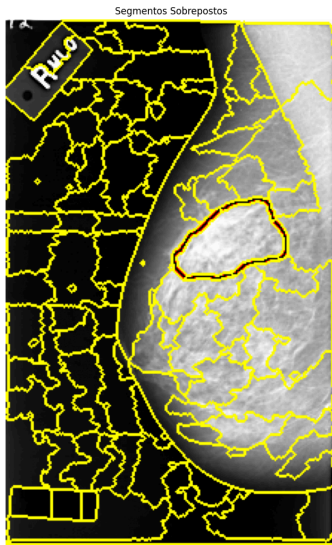
    # Construção do RAG manualmente
    print("Construindo a RAG manualmente...")
    rag = build_rag_manual(image, segments)

    # Visualização
    print("Visualizando a RAG e os Segmentos...")
    visualize_all(image, segments, rag)

if __name__ == '__main__':
    main()

```

 Faça upload da imagem:
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 Saving 1_C_0001_1.RIGHT_MLO.LJPEG.1_highpass - Copia.png to 1_C_0001_1.RIGHT_MLO.LJPEG.1_highpass - Copia (5).png
 Arquivo 1_C_0001_1.RIGHT_MLO.LJPEG.1_highpass - Copia (5).png carregado com sucesso!
 Gerando segmentos com Watershed...
 Construindo a RAG manualmente...
 Visualizando a RAG e os Segmentos...



✓ Implementando o algoritmo para o método de segmentação Connected Components.

```

# Importação das bibliotecas necessárias
import numpy as np
import matplotlib.pyplot as plt
from google.colab import files
from skimage import io, color, filters
from skimage.measure import label
from skimage.segmentation import mark_boundaries
import networkx as nx

def upload_image():
    """Solicita ao usuário o upload de uma imagem."""
    uploaded = files.upload()
    for filename in uploaded.keys():
        print(f"Arquivo {filename} carregado com sucesso!")
    return io.imread(filename)

def generate_segments_with_connected_components(image, threshold=0.5):
    """
    Gera segmentos usando o método de Componentes Conectados.

    Parâmetros:
    - image: Imagem de entrada.
    - threshold: Limiar para binarização (0 a 1).

    Retorna:
    - segments: Segmentos gerados.
    """
    # Converte a imagem para escala de cinza
    if len(image.shape) == 3:
        image_gray = color.rgb2gray(image)
  
```

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else:
    image_gray = image

# Aplica o limiar à imagem
binary = image_gray > filters.threshold_otsu(image_gray) * threshold

# Gera os componentes conectados
segments = label(binary)
return segments

def build_rag_manual(image, segments):
    """
    Constrói o Region Adjacency Graph (RAG) manualmente.

    Parâmetros:
    - image: Imagem de entrada.
    - segments: Segmentos gerados.

    Retorna:
    - G: Grafo construído.
    """
    G = nx.Graph()

    # Adiciona os nós ao grafo
    for region in np.unique(segments):
        G.add_node(region)

    # Identifica pixels vizinhos para adicionar arestas
    rows, cols = segments.shape
    for r in range(rows - 1):
        for c in range(cols - 1):
            current = segments[r, c]
            right = segments[r, c + 1]
            down = segments[r + 1, c]
            if current != right:
                G.add_edge(current, right)
            if current != down:
                G.add_edge(current, down)
    return G

def visualize_all(image, segments, rag):
    """
    Exibe três imagens lado a lado:
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    Parâmetros:
    - image: Imagem de entrada.
    - segments: Segmentos gerados.
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    """
    fig, ax = plt.subplots(1, 3, figsize=(30, 10))

    # Segmentos sobrepostos
    ax[0].imshow(mark_boundaries(image, segments))
    ax[0].set_title("Segmentos Sobrepostos")
    ax[0].axis("off")

    # RAG sobreposto à imagem
    ax[1].imshow(image)
    pos = {}
    for region in np.unique(segments):
        mask = segments == region
        y, x = np.mean(np.argwhere(mask), axis=0)
        pos[region] = (x, y)

    nx.draw(rag, pos, ax=ax[1], node_size=10, edge_color="yellow", node_color="red", with_labels=False)
    ax[1].set_title("RAG Sobreposto à Imagem")
    ax[1].axis("off")

    # Segmentos e RAG juntos
    ax[2].imshow(mark_boundaries(image, segments))
    nx.draw(rag, pos, ax=ax[2], node_size=10, edge_color="yellow", node_color="red", with_labels=False)
    ax[2].set_title("Segmentos e RAG Sobrepostos")
    ax[2].axis("off")

    plt.tight_layout()
    plt.show()

# Pipeline Principal
def main():

```

```

print("Faça upload da imagem:")
image = upload_image()

# Garantir que a imagem seja RGB
if len(image.shape) == 2 or image.shape[2] == 1:
    image = color.gray2rgb(image)

# Geração de Segmentos
print("Gerando segmentos com Componentes Conectados...")
segments = generate_segments_with_connected_components(image, threshold=0.5)

# Construção do RAG manualmente
print("Construindo a RAG manualmente...")
rag = build_rag_manual(image, segments)

# Visualização
print("Visualizando a RAG e os Segmentos...")
visualize_all(image, segments, rag)

if __name__ == '__main__':
    main()

```

↗ Faça upload da imagem:

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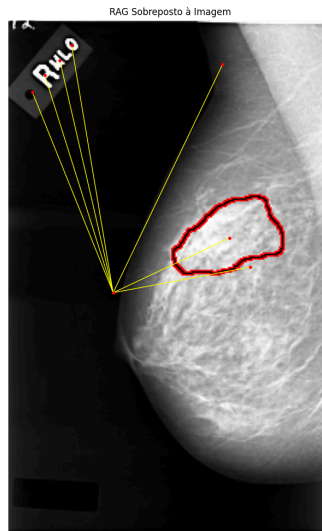
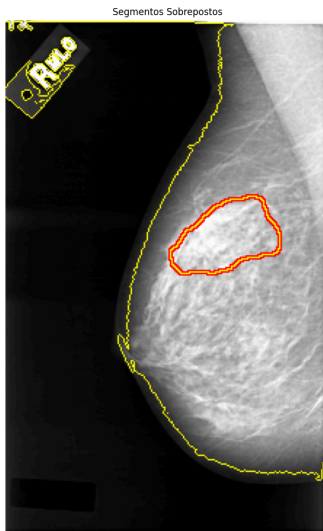
Saving 1_C_0001_1.RIGHT_MLO.LJPEG.1_highpass - Copia.png to 1_C_0001_1.RIGHT_MLO.LJPEG.1_highpass - Copia (6).png

Arquivo 1_C_0001_1.RIGHT_MLO.LJPEG.1_highpass - Copia (6).png carregado com sucesso!

Gerando segmentos com Componentes Conectados...

Construindo a RAG manualmente...

Visualizando a RAG e os Segmentos...



✓ Instalando a biblioteca para análise da quantidade de memória usada pelos algoritmos processarem as segmentações.

```
!pip install memory_profiler
```

↗ Collecting memory_profiler

Downloading memory_profiler-0.61.0-py3-none-any.whl.metadata (20 kB)

Requirement already satisfied: psutil in /usr/local/lib/python3.10/dist-packages (from memory_profiler) (5.9.5)

Downloading memory_profiler-0.61.0-py3-none-any.whl (31 kB)

```
Installing collected packages: memory_profiler
Successfully installed memory_profiler-0.61.0
```

```
import numpy as np
import time
from skimage import io, color
from skimage.segmentation import slic, felzenszwalb, watershed
from skimage.measure import label
from skimage import filters
from tabulate import tabulate
from google.colab import files
from memory_profiler import memory_usage

def upload_image():
    """Solicita ao usuário o upload de uma imagem."""
    uploaded = files.upload()
    for filename in uploaded.keys():
        print(f"Arquivo {filename} carregado com sucesso!")
        return io.imread(filename)

def measure_time_and_memory(func, *args, **kwargs):
    """
    Mede o tempo de execução e o uso de memória de uma função.
    """
    # Medir tempo de execução
    start_time = time.time()

    # Medir uso de memória durante a execução
    mem_usage = memory_usage((func, args, kwargs), interval=0.1) # interval ajustado

    # Executar a função
    result = func(*args, **kwargs)

    # Medir tempo de execução
    end_time = time.time()
    execution_time = end_time - start_time

    # Encontrar o pico de memória usado (em MB)
    max_mem_usage = max(mem_usage) / 1024 # Convertendo para MB

    # Retornar o resultado, tempo de execução e memória usada (em MB)
    return result, execution_time, max_mem_usage

def generate_slic(image, n_segments=200, compactness=10):
    """
    Gera superpixels usando a técnica SLIC.
    """
    segments = slic(image, n_segments=n_segments, compactness=compactness, start_label=1)
    return segments

def generate_felzenszwalb(image):
    """
    Gera superpixels usando o algoritmo de Felzenszwalb.
    """
    segments = felzenszwalb(image, scale=100, sigma=0.5, min_size=50)
    return segments

def generate_watershed(image):
    """
    Gera superpixels usando o algoritmo Watershed.
    """
    # Gerar o gradiente da imagem
    gradient = filters.sobel(image)

    # Identificar os máximos locais
    markers = label(gradient < 0.1)

    # Gerar os segmentos usando o Watershed
    segments = watershed(gradient, markers)
    return segments

def generate_connected_components(image):
    """
    Gera componentes conectados usando o algoritmo de Connected Components.
    """
    # Convertendo a imagem para escala de cinza e binarizando
    gray_image = color.rgb2gray(image)
    binary_image = gray_image > 0.5 # Threshold para binarização

    # Encontrar os componentes conectados
    labeled_image = label(binary_image)
    return labeled_image
```

```
def main():
    print("Faça upload da imagem:")
    image = upload_image()

    # Garantir que a imagem seja RGB
    if len(image.shape) == 2 or image.shape[2] == 1:
        image = color.gray2rgb(image)

    # Medir tempo e memória para SLIC
    print("Gerando superpixels com SLIC...")
    _, slic_time, slic_memory = measure_time_and_memory(generate_slic, image, n_segments=300, compactness=20)


    # Medir tempo e memória para Felzenszwalb
    print("Gerando superpixels com Felzenszwalb...")
    _, felzenszwalb_time, felzenszwalb_memory = measure_time_and_memory(generate_felzenszwalb, image)

    # Medir tempo e memória para Watershed
    print("Gerando superpixels com Watershed...")
    _, watershed_time, watershed_memory = measure_time_and_memory(generate_watershed, image)

    # Medir tempo e memória para Connected Components
    print("Gerando superpixels com Connected Components...")
    _, connected_components_time, connected_components_memory = measure_time_and_memory(generate_connected_components, image)

    # Exibir a tabela de resultados
    table = [
        ["SLIC", slic_time, slic_memory],
        ["Felzenszwalb", felzenszwalb_time, felzenszwalb_memory],
        ["Watershed", watershed_time, watershed_memory],
        ["Connected Components", connected_components_time, connected_components_memory]
    ]
    headers = ["Método", "Tempo (segundos)", "Memória (MB)"]
    print(tabulate(table, headers=headers, tablefmt="pretty"))

if __name__ == '__main__':
    main()
```

 Faça upload da imagem:
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Saving 1_C_0001_1.RIGHT_MLO.LJPEG.1_highpass - Copia.png to 1_C_0001_1.RIGHT_MLO.LJPEG.1_highpass - Copia (1).png

Arquivo 1_C_0001_1.RIGHT_MLO.LJPEG.1_highpass - Copia (1).png carregado com sucesso!

Gerando superpixels com SLIC...

Gerando superpixels com Felzenszwalb...

Gerando superpixels com Watershed...

Gerando superpixels com Connected Components...

Método	Tempo (segundos)	Memória (MB)
SLIC	0.44673919677734375	0.6839561462402344
Felzenszwalb	0.48841381072998047	0.7021217346191406
Watershed	0.41265225410461426	0.7007484436035156
Connected Components	0.09787392616271973	0.6844062805175781

```
import numpy as np
import time
from skimage import io, color
from skimage.segmentation import slic, felzenszwalb, watershed
from skimage.measure import label
from skimage import filters
from tabulate import tabulate
from google.colab import files
from memory_profiler import memory_usage

def upload_image():
    """Solicita ao usuário o upload de uma imagem."""
    uploaded = files.upload()
    for filename in uploaded.keys():
        print(f"Arquivo {filename} carregado com sucesso!")
        return io.imread(filename)

def measure_time_and_memory(func, *args, **kwargs):
    """
    Mede o tempo de execução e o uso de memória de uma função.
    """
    # Medir tempo de execução
    start_time = time.time()

    # Medir uso de memória durante a execução
    mem_usage = memory_usage((func, args, kwargs), interval=0.1) # interval ajustado

    # Executar a função
```

```
result = func(*args, **kwargs)

# Medir tempo de execução
end_time = time.time()
execution_time = end_time - start_time

# Encontrar o pico de memória usado (em MB)
max_mem_usage = max(mem_usage) / 1024 # Convertendo para MB

# Retornar o resultado, tempo de execução e memória usada (em MB)
return result, execution_time, max_mem_usage

def generate_slic(image, n_segments=200, compactness=10):
    """
    Gera superpixels usando a técnica SLIC.
    """
    segments = slic(image, n_segments=n_segments, compactness=compactness, start_label=1)
    return segments

def generate_felzenszwalb(image):
    """
    Gera superpixels usando o algoritmo de Felzenszwalb.
    """
    segments = felzenszwalb(image, scale=100, sigma=0.5, min_size=50)
    return segments

def generate_watershed(image):
    """
    Gera superpixels usando o algoritmo Watershed.
    """
    # Gerar o gradiente da imagem
    gradient = filters.sobel(image)

    # Identificar os máximos locais
    markers = label(gradient < 0.1)

    # Gerar os segmentos usando o Watershed
    segments = watershed(gradient, markers)
    return segments

def generate_connected_components(image):
    """
    Gera componentes conectados usando o algoritmo de Connected Components.
    """
    # Convertendo a imagem para escala de cinza e binarizando
    gray_image = color.rgb2gray(image)
    binary_image = gray_image > 0.5 # Threshold para binarização

    # Encontrar os componentes conectados
    labeled_image = label(binary_image)
    return labeled_image

def main():
    print("Faça upload da imagem:")
    image = upload_image()

    # Garantir que a imagem seja RGB
    if len(image.shape) == 2 or image.shape[2] == 1:
        image = color.gray2rgb(image)

    # Medir tempo e memória para SLIC
    print("Gerando superpixels com SLIC...")
    _, slic_time, slic_memory = measure_time_and_memory(generate_slic, image, n_segments=300, compactness=20)

    # Medir tempo e memória para Felzenszwalb
    print("Gerando superpixels com Felzenszwalb...")
    _, felzenszwalb_time, felzenszwalb_memory = measure_time_and_memory(generate_felzenszwalb, image)

    # Medir tempo e memória para Watershed
    print("Gerando superpixels com Watershed...")
    _, watershed_time, watershed_memory = measure_time_and_memory(generate_watershed, image)


    # Medir tempo e memória para Connected Components
    print("Gerando superpixels com Connected Components...")
    _, connected_components_time, connected_components_memory = measure_time_and_memory(generate_connected_components, image)

    # Exibir a tabela de resultados
    table = [
        ["SLIC", slic_time, slic_memory],
        ["Felzenszwalb", felzenszwalb_time, felzenszwalb_memory],
        ["Watershed", watershed_time, watershed_memory],
        ["Connected Components", connected_components_time, connected_components_memory]
```



```
]
headers = ["Método", "Tempo (segundos)", "Memória (MB)"]
print(tabulate(table, headers=headers, tablefmt="pretty"))

if __name__ == '__main__':
    main()
```

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Saving 13_C_0004_1.RIGHT_MLO.LJPEG.1_highpass - Copia.png to 13_C_0004_1.RIGHT_MLO.LJPEG.1_highpass - Copia.png
Saving 13_C_0004_1.RIGHT_MLO.LJPEG.1_highpass.png to 13_C_0004_1.RIGHT_MLO.LJPEG.1_highpass.png
Saving 14_C_0004_1.LEFT_MLO.LJPEG.1_highpass.png to 14_C_0004_1.LEFT_MLO.LJPEG.1_highpass.png
Saving 15_C_0004_1.RIGHT_CC.LJPEG.1_highpass - Copia.png to 15_C_0004_1.RIGHT_CC.LJPEG.1_highpass - Copia.png
Saving 15_C_0004_1.RIGHT_CC.LJPEG.1_highpass.png to 15_C_0004_1.RIGHT_CC.LJPEG.1_highpass.png
Saving 16_C_0004_1.LEFT_CC.LJPEG.1_highpass.png to 16_C_0004_1.LEFT_CC.LJPEG.1_highpass.png
Saving 17_C_0006_1.RIGHT_MLO.LJPEG.1_highpass - Copia.png to 17_C_0006_1.RIGHT_MLO.LJPEG.1_highpass - Copia.png
Saving 17_C_0006_1.RIGHT_MLO.LJPEG.1_highpass.png to 17_C_0006_1.RIGHT_MLO.LJPEG.1_highpass.png
Saving 18_C_0006_1.LEFT_MLO.LJPEG.1_highpass.png to 18_C_0006_1.LEFT_MLO.LJPEG.1_highpass.png
Saving 19_C_0006_1.RIGHT_CC.LJPEG.1_highpass.png to 19_C_0006_1.RIGHT_CC.LJPEG.1_highpass.png
Saving 20_C_0006_1.LEFT_CC.LJPEG.1_highpass.png to 20_C_0006_1.LEFT_CC.LJPEG.1_highpass.png
Saving 21_C_0007_1.RIGHT_MLO.LJPEG.1_highpass.png to 21_C_0007_1.RIGHT_MLO.LJPEG.1_highpass.png
Saving 22_C_0007_1.LEFT_MLO.LJPEG.1_highpass.png to 22_C_0007_1.LEFT_MLO.LJPEG.1_highpass.png
Saving 23_C_0007_1.RIGHT_CC.LJPEG.1_highpass.png to 23_C_0007_1.RIGHT_CC.LJPEG.1_highpass.png
Saving 24_C_0007_1.LEFT_CC.LJPEG.1_highpass.png to 24_C_0007_1.LEFT_CC.LJPEG.1_highpass.png
Saving 25_C_0009_1.RIGHT_MLO.LJPEG.1_highpass.png to 25_C_0009_1.RIGHT_MLO.LJPEG.1_highpass.png
Saving 26_C_0009_1.LEFT_MLO.LJPEG.1_highpass.png to 26_C_0009_1.LEFT_MLO.LJPEG.1_highpass.png
Saving 27_C_0009_1.RIGHT_CC.LJPEG.1_highpass.png to 27_C_0009_1.RIGHT_CC.LJPEG.1_highpass.png
Saving 28_C_0009_1.LEFT_CC.LJPEG.1_highpass.png to 28_C_0009_1.LEFT_CC.LJPEG.1_highpass.png
Saving 29_C_0010_1.RIGHT_MLO.LJPEG.1_highpass.png to 29_C_0010_1.RIGHT_MLO.LJPEG.1_highpass.png
Saving 30_C_0010_1.LEFT_MLO.LJPEG.1_highpass.png to 30_C_0010_1.LEFT_MLO.LJPEG.1_highpass.png
Saving 31_C_0010_1.RIGHT_CC.LJPEG.1_highpass.png to 31_C_0010_1.RIGHT_CC.LJPEG.1_highpass.png
Saving 32_C_0010_1.LEFT_CC.LJPEG.1_highpass.png to 32_C_0010_1.LEFT_CC.LJPEG.1_highpass.png
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Saving 35_C_0011_1.RIGHT_CC.LJPEG.1_highpass.png to 35_C_0011_1.RIGHT_CC.LJPEG.1_highpass.png
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Saving 37_C_0012_1.RIGHT_MLO.LJPEG.1_highpass.png to 37_C_0012_1.RIGHT_MLO.LJPEG.1_highpass.png
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Saving 39_C_0012_1.RIGHT_CC.LJPEG.1_highpass.png to 39_C_0012_1.RIGHT_CC.LJPEG.1_highpass.png
Saving 40_C_0012_1.LEFT_CC.LJPEG.1_highpass.png to 40_C_0012_1.LEFT_CC.LJPEG.1_highpass.png
Saving 41_C_0014_1.RIGHT_MLO.LJPEG.1_highpass.png to 41_C_0014_1.RIGHT_MLO.LJPEG.1_highpass.png
Saving 42_C_0014_1.LEFT_MLO.LJPEG.1_highpass.png to 42_C_0014_1.LEFT_MLO.LJPEG.1_highpass.png
Saving 43_C_0014_1.RIGHT_CC.LJPEG.1_highpass.png to 43_C_0014_1.RIGHT_CC.LJPEG.1_highpass.png
Saving 44_C_0014_1.LEFT_CC.LJPEG.1_highpass.png to 44_C_0014_1.LEFT_CC.LJPEG.1_highpass.png
Saving 45_C_0015_1.RIGHT_MLO.LJPEG.1_highpass.png to 45_C_0015_1.RIGHT_MLO.LJPEG.1_highpass.png
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Saving 47_C_0015_1.RIGHT_CC.LJPEG.1_highpass.png to 47_C_0015_1.RIGHT_CC.LJPEG.1_highpass.png
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Saving 64_C_0020_1.LEFT_CC.LJPEG.1_highpass.png to 64_C_0020_1.LEFT_CC.LJPEG.1_highpass.png
Saving 65_B_3001_1.RIGHT_MLO.LJPEG.1_highpass.png to 65_B_3001_1.RIGHT_MLO.LJPEG.1_highpass.png
Saving 66_B_3001_1.LEFT_MLO.LJPEG.1_highpass.png to 66_B_3001_1.LEFT_MLO.LJPEG.1_highpass.png
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Saving 78_B_3007_1.LEFT_MLO.LJPEG.1_highpass.png to 78_B_3007_1.LEFT_MLO.LJPEG.1_highpass.png
Saving 79_B_3007_1.RIGHT_CC.LJPEG.1_highpass.png to 79_B_3007_1.RIGHT_CC.LJPEG.1_highpass.png
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lab research google.com/drive/1EnAvqkSAyGo-TyuRISPINz5XiCIs5Pgr#printMode=true

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Saving 352_C_0048_1.LEFT_CC.LJPEG.1_highpass.png to 352_C_0048_1.LEFT_CC.LJPEG.1_highpass.png
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Saving 378_C_0062_1.LEFT_MLO.LJPEG.1_highpass.png to 378_C_0062_1.LEFT_MLO.LJPEG.1_highpass.png
Saving 379_C_0062_1.RIGHT_CC.LJPEG.1_highpass.png to 379_C_0062_1.RIGHT_CC.LJPEG.1_highpass.png
Saving 380_C_0062_1.LEFT_CC.LJPEG.1_highpass.png to 380_C_0062_1.LEFT_CC.LJPEG.1_highpass.png
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